6.0 MITIGATION MEASURES

6.1 Introduction

CEQ requires that all relevant reasonable mitigation measures that could improve a project should be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies (40 CFR 30 parts 1500 et seq., 2005). This serves to alert agencies or officials who can implement these extra measures, and to encourage them to do so. As this analysis is programmatic in nature and does not address exact locations, it is understood that detailed mitigation measures would be addressed on a site specific basis.

6.2 Roles and Responsibilities

As a part of the individual CREP contract approval process, consultation with the appropriate agencies would be conducted to reduce or eliminate potential impacts to resources identified in this PEA. For example, FWS would provide guidance to ensure that actions do not jeopardize or destroy threatened, endangered, or candidate species or their habitat. OSHPO and tribal agencies with cultural resources oversight would review actions to minimize potential impacts to cultural resources.

6.3 Mitigations

This chapter presents mitigation measures that would be used to avoid or lessen impacts to resources including biological, cultural, water, soil, air, and scenic rivers.

Biological Resources

- Current or historical grassland areas presently devoid of woody vegetation should not be entered into contracts that involve the planting of woody vegetation. Doing so would increase brood parasitism and predation on grassland nesting species and some neotropical migrant species by creating perch sites for avian predators, such as hawks and owls. It would also create travel corridors for terrestrial predators, such as skunks and raccoons.

- Factors affecting American burying beetle habitat selection are the presence or absence of carrion, and top soil and humus suitable for burying carrion. Therefore, it will be difficult to determine the presence or absence of this species on lands that may be enrolled in CREP. Since 1992, there have been confirmed sightings of American burying beetles in Cherokee and Sequoyah counties (OES 2005b). There have been unconfirmed sightings (defined as a likely sighting, but one that has not been confirmed by an entomologist or a FWS biologist) of the species since 1992 in Delaware and Adair counties. Consultation with FWS and the completion of project evaluation forms will need to be conducted prior to implementation of any CREP activities on lands that may hold American burying beetles (OES 2005b).

- The encroachment of vegetation on piping plover nesting areas due to habitat modification is a major factor affecting this species. Areas of known seasonal piping plover inhabitance should not be planted with any vegetation either on or in the vicinity of potential nesting areas.

- If riparian buffers are to be harvested periodically to restore productivity, some dead or dying snags should be left for cavity nesting species such as woodpeckers that may inhabit the area. Timing of harvests should not coincide with the breeding or rearing times of any sensitive species. It is expected that periodic harvesting would temporarily interrupt daily migration patterns of resident wildlife.

- CP implementation that requires the use of herbicides, pesticides, fertilizers, lime, or any other

such applications, as well as the timing of CP implementation, should be conducted in accordance with conservation plan recommendations to ensure no harm occurs to any fish or wildlife species, or to their associated habitats. Application of herbicides, pesticides, fertilizers, or lime would be strictly according to label instructions.

Cultural Resources

- OSHPO and any other State, Federal, and tribal agencies with cultural resources oversight should be consulted as individual CREP contract is developed and implemented, as appropriate. This would indicate if any cultural resources are known within the ROI or if additional field inventories would be necessary.

Water Resources

- Installation of CPs may involve the clearing of vegetation and some soil disturbance. These activities may result in high levels of sediment runoff, resulting in temporary adverse impacts to surface water quality. The use of filter fencing or similar mitigation practices and compliance with local and State regulatory requirements, such as obtaining stormwater pollution permits for construction sites over 1 acre, would reduce these impacts (ODEQ 2002b).

Soil Resources

- Short-term disturbances to soils during implementation of CPs may include tilling or installation of various structures such as fences, breakwaters, and roads. These activities may result in temporary increases in soil erosion. The use of silt fencing, filter fabric, or similar measures would reduce these impacts.

Air

- Implementation of the proposed CPs may include activities such as tilling and burning. This may temporarily increase particulate matter and other pollutants and adversely impact local air quality. Impacts would be minimized by measures such as watering exposed soil before and after tilling and burning in moderation and only in approved weather conditions.

- Installing various structures such as roads, firebreaks, and fences may require the temporary use of heavy-duty diesel construction vehicles. Primary emissions from construction vehicles include carbon monoxide and some particulate matter. BMPs would be used during construction activities to reduce the amount of emissions.

Scenic Rivers

- Installation of CPs may involve the clearing of vegetation and some soil disturbance. This may result in high levels of sediment runoff, resulting in temporary adverse impacts to water quality of the scenic rivers. The use of filter fencing or similar measures would reduce these impacts.

Environmental Justice

- Approximately 20 percent of the residents in the ROI fall below the poverty threshold, classifying the ROI as a poverty area. Removing lands from agricultural production may eliminate some farm worker positions; however, the preferred alternative is expected to generate other non-farm employment activities within the ROI. When contracts with farmers and ranchers are prepared, efforts should be made to identify displaced farm workers. These individuals should be preferentially hired to support CP establishment and maintenance.

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8.0 PERSONS AND AGENCIES CONTACTED

Table 19 shows the Federal, State, and local agencies; American Indian tribes; and interest groups contacted for the CREP PEA.

Table 19. CREP PEA consultation.

Name	Title	Agency
Bales, Sara	Regional Wildlife Biologist	Pheasants Forever and Quail Forever, Oklahoma Chapters
Birdwell, James	President	Oklahoma Cattlemen's Association
Brabander, Jerry	Field Supervisor	U.S. Fish and Wildlife Service
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Johanntoberns, Troy	Director of Environmental Programs	Wichita and Affiliated Tribes
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Kennington, John	President	Tulsa Audubon Society
Kisling, Keith	Chairman	Oklahoma Wheat Commission
Kouplen, Steve	President of State Board of Directors	Oklahoma Farm Bureau
Ludgate, Sandy	Director of Environmental Programs	Caddo Nation
McDaniels, Andy	Executive Director	Oklahoma Wildlife Federation
Parrish, D.J.	Director of Agricultural Environmental Management Services	Oklahoma Department of Agriculture, Food, and Forestry
Pruett, Jay	Director of Conservation	The Nature Conservancy, Oklahoma Chapter
Quay, Steve	State Chairman	Oklahoma Ducks Unlimited
Smith, Chadwick 'Corntassel'	Principal Chief	Cherokee Nation
Vogele, Louis	Planning, Environmental, and Regulatory Division	U.S. Army Corps of Engineers, Tulsa District
Wanger, Rod	Conservation Program Specialist	Farm Service Agency, Oklahoma State Office
Wasinger, Jennifer	President	Oklahoma Clean Lakes and Watersheds Association
Wulf, Ray L.	President	Oklahoma Farmer's Union

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9.0 GLOSSARY

Agricultural Pollution—Wastes, emissions, and discharges arising from farming activities. Causes include runoff and leaching of pesticides and fertilizers; pesticide drift and volatilization; erosion and dust from cultivation; and improper disposal of animal manure and carcasses. Some agricultural pollution is point source (e.g., large feedlots), but much is non-point source, meaning that it derives from dispersed origins.

Algae Bloom—Rapid and flourishing growth of algae in and on a body of water.

Aquifer—An underground formation capable of storing and yielding significant quantities of water; usually composed of sand, gravel, or permeable rock.

Carbon Sequestration—The net removal or fixation of carbon dioxide (CO_2) from the atmosphere or in a carbon sink into long-lived pools of carbon through biological or physical processes. These pools can be living, aboveground biomass (e.g., trees), products with a long, useful life created from biomass (e.g., lumber), living biomass in soils (e.g., roots and microorganisms), or recalcitrant organic and inorganic carbon in soils and deeper subsurface environments.

Coliform—Bacteria common to the intestinal tract of warm-blooded animals, including humans.

Conservation—The management of human and natural resources to provide maximum benefits over a sustained period of time. Conservation practices focus on conserving soil, water, energy, and biological resources.

Conservation Easement—Acquisition of rights and interest to a property to protect identified conservation or resource values using a reserved interest deed.

Conservation Practice—Any technique or measure used to protect soil and water resources for which standards and specifications for installation, operation, or maintenance have been developed.

Cost Sharing—Payments to producers to cover a specified portion of the cost of installing, implementing, or maintaining a conservation practice.

Cropland—A land use/land cover category that includes five components: cropland harvested, crop failure, cultivated summer fallow, cropland used only for pasture, and idle cropland.

Dissolved Oxygen—Amount of free oxygen found in water; most commonly used measurement of water quality.

Easement—A landowner sells or surrenders the right to develop a portion of the property, usually in return for a payment or some other benefit.

Ecosystem—A level of organization within the living world that includes both the total array of biological organisms present in a defined area and the chemical/physical factors that influence the plants and animals in it; all biological and non-biological variables within a defined area.

Endangered Species—A species that is threatened with extinction throughout all or a significant portion of its range.

Erosion—The removal and loss of soil by the action of water, ice, gravity, or wind.

Ethnicity—A person either of Hispanic or Latino origin and any race, or not of Hispanic or Latino origin and any race.

Eutrophication—A process where more organic matter is produced than existing biological oxidization processes can consume.

Extreme Poverty Area—An area in which at least 40 percent of the residents are below the poverty threshold.

Farm Income—The earnings of a farming operation over a given period of time, measured by several factors: 1) Gross cash income is the sum of all receipts from the sale of crops, livestock, and farm-related goods and services, as well as all forms of direct payments from the government. 2) Gross farm income is the same as gross cash income with the addition of non-money income, such as the value of home consumption of self-produced food and the imputed gross rental value of farm dwellings. 3) Net cash income is gross cash income less all cash expenses such as for feed, seed, fertilizer, property taxes, interest on debt, wages to hired labor, contract labor and rent to non-operator landlords. 4) Net farm income is gross farm income less cash expenses and non-cash expenses, such as capital consumption, perquisites to hired labor, and farm household expenses. 5) Net farm income is a longer-term measure of the ability of the farm to survive as a viable income-earning business. 6) Net cash income is a shorter-term measure of cash flow.

Filter Strip—An area of vegetation, generally narrow and long, that slows the rate of runoff, allowing sediments, organic matter, and other pollutants that are being conveyed by the water to be removed.

Floodplain—The lowland that borders a stream or river and is found outside of the floodway. It is usually dry, but subject to flooding.

Flyway—A general term used to describe common migrating patterns among different bird species, based on definite geographic regions.

Groundwater—Water in the porous rocks and soils of the Earth's crust; a large proportion of the total supply of fresh water.

Hispanic or Latino Origin—A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.

Hydrology—The study of the distribution, movement, and chemical makeup of surface and ground waters.

Introduced Species—Species that have evolved elsewhere and have been transported and purposely or accidentally disseminated by humans. Other terms used to describe these species are alien, exotic, non-native, and non-indigenous.

Invasive Species—A species that is non-native to the ecosystem under consideration, and whose introduction causes or is likely to cause harm to the economy, environmental, or human health.

Low-income—Individuals or households falling below the poverty threshold.

Median Household Income—The income level which divides the income distribution of all of the households in a given area into two equal groups; half of the households having incomes above the median, and half having incomes below the median.

Minority population—A population composed of a minority group and exceeding 50 percent of the population in an area or the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population.

Mitigation—A method or action to reduce or eliminate adverse impacts.

Native Grasses—Various regional and national grasses that were original to particular areas of the U.S.; regional with regards to soils, acidity or alkalinity, climate, diseases, and symbiotic coexistence with other plants in the surrounding area.

Neotropical Migrants—Bird species that annually migrate to the tropics during the northern winter months.

Nitrate—The nitrogen ion, NO_3-, is derived from nitric acid and is an important source of nitrogen in fertilizers. Nitrate pollution of drinking water, shallow wells being particularly vulnerable, is of concern because infants are especially sensitive.

Nutrient—Usually nitrogen or phosphorus. Excessive inputs of a nutrient can cause of eutrophication of surface waters and stimulate algal growth. Sources of nutrients include runoff from fields and pastures, discharges from septic tanks and feedlots, and emissions from combustion.

Ozone—A highly reactive molecule composed of three oxygen atoms. Environmentally, ozone is important in two completely separate contexts—one, as a naturally occurring screen of harmful radiation in the outer atmosphere (i.e., stratospheric ozone), and two, as a component of polluting smog formed from emissions resulting from human activities (i.e., urban smog). In the stratosphere 7 to 10 miles above the Earth, naturally occurring ozone acts to shield the Earth from harmful radiation.

Particulate Matter—Air pollutants, including dust, soot, dirt, smoke, and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires, and natural windblown dust.

Pastureland—A land use/land cover category of land managed primarily for the production of introduced forage plants for livestock grazing. For the NRI, includes land that has a vegetative cover of grasses, legumes, and/or forbs, regardless of whether or not it is being grazed by livestock.

Poverty area—An area in which at least 20 percent of the residents are below the poverty threshold.

Poverty Thresholds—For statistical purposes (e.g., counting the poor population), the U.S. Census Bureau uses a set of annual income levels (poverty thresholds) that represent a Federal Government estimate of the point below which a household of a given size has cash income insufficient to meet minimal food and other basic needs. They were developed in the 1960s, based largely on estimates of the minimal cost of food needs, to measure changes in the poor population. The thresholds differ by household size and are adjusted annually for overall inflation.

Race—Classification which includes White, Black or African American, American Indian or Alaskan Native, Asian, and Native Hawaiian or Other Pacific Islander.

Rangeland—A land cover/land use category on which the climax or potential plant cover is composed principally of native grasses, grass-like plants, forbs, or shrubs suitable for grazing and browsing, and introduced forage species that are managed like rangeland. For the NRI, grasslands, savannas, many wetlands, some deserts, and tundra were considered to be rangeland.

Riparian Areas—Lands adjacent to rivers and streams that are influenced by flooding. They are considered transition zones between the aquatic and terrestrial ecosystem that are connected by direct land-water interaction.

Runoff—Non-infiltrating water entering a stream or other conveyance channel shortly after a rainfall.

Sediment—Any finely divided organic and/or mineral matter derived from rock or biological sources that have been transported and deposited by water or air.

Sedimentation—The process of depositing sediment from suspension in water.

Threatened Species—A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Total Maximum Daily Load (TMDL)—A TMDL identifies the amount of a specific pollutant or property of a pollutant, from a point source ("end of the pipe"), a non-point source (from runoff), and natural background sources, including a margin of safety, that may be discharged to a water body and still ensure that the water body attains water quality standards.

Watershed—The land across and under which water flows on its way to a stream, river, lake, or other water body; the surface drainage area above a specified point on a stream.

Wetlands—Areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil, including swamps, marshes, bogs, and other similar areas.

Woodland—A land cover/land use category that includes wooded pastureland and wooded non-pastureland.

10.0 REFERENCES

7 CFR 7 parts 799 et seq. 2006. "Environmental Quality and Related Environmental Concerns—Compliance with the National Environmental Policy Act." Farm Service Agency, Department of Agriculture. *Code of Federal Regulations*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/cfr/index.html. January 1. Accessed February 23, 2006.

33 CFR 3 part 328.3. 2005. "Definitions." Navigation and Navigable Waters. Corps of Engineers, Department of the Army. *Code of Federal Regulations*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/cfr/index.html. July 1. Accessed January 24, 2006.

36 CFR 1 parts 62.1–62.9. 2005. "National Natural Landmark Program." Parks, Forests, and Public Property. *Code of Federal Regulations*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/cfr/index.html. July 1. Accessed February 23, 2006.

36 CFR 8 parts 800.3–800.13. 2005. "Subpart B—The Section 106 Process." Protection of Historic Properties. Parks, Forests, and Public Property. Advisory Council on Historic Preservation. *Code of Federal Regulations*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/cfr/index.html. July 1. Accessed February 23, 2006.

40 CFR 30 parts 1500 et seq. 2005. "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act." Chapter 5. Council on Environmental Quality, Executive Office of the President. *Code of Federal Regulations*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/cfr/index.html. July 1. Accessed February 23, 2006.

32 FR 4001. 1967. "Endangered Species List, 1967." Final Rule. *Federal Register*. 50 CFR part 17. Fish and Wildlife Service Interior.

35 FR 4247. 1977. Executive Order 11514, as amended. "Protection and Enhancement of Environmental Quality." *Federal Register*. U.S. National Archives and Records Administration. Available via http://www.archives.gov/federal-register/codification/executive-order/11514.html. Accessed February 23, 2006.

41 FR 83. 1976. "Endangered and Threatened Wildlife and Plants; Determination that Two Species of Butterflies are Threatened and Two Species of Mammals are Endangered Species." Final Rule. *Federal Register*. 50 CFR part 17. Fish and Wildlife Service Interior, pp. 17736–17740.

42 FR 26951. 1979. Executive Order 11988, as amended. "Floodplain Management." *Federal Register*. U.S. National Archives and Records Administration. Available via http://www.archives.gov/federal-register/codification/executive-order/11988.html. Accessed February 23, 2006.

44 FR 232. 1979. "Endangered and Threatened Wildlife and Plants; Listing of Virginia and Ozark Big-Eared Bats as Endangered Species and Critical Habitat Determination." Final Rule. *Federal Register*. 50 CFR part 17. Fish and Wildlife Service Interior, pp. 69206–69208.

49 FR 213. 1984. "Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Ozark Cavefish (*Amblyopsis rosae*)." Final Rule. *Federal Register*. 50 CFR part 17. Fish and Wildlife Service Interior, pp. 43965–43969.

50 FR 102. 1985. "Endangered and Threatened Wildlife and Plants; Interior Population of the Least Tern Determined to be Endangered." Final Rule. *Federal Register*. 50 CFR part 17. Fish and Wildlife Service Interior, pp. 21784–21792.

54 FR 133. 1989. "Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the American Burying Beetle" Final Rule. *Federal Register*. 50 CFR part 17. Fish and Wildlife Service Interior, pp. 29652–29655.

59 FR 32. 1995. Executive Order 12898, as amended. "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." *Federal Register*. U.S. National Archives and Records Administration. Available via http://www.archives.gov/federal-register/executive-orders/1994.html. Accessed February 23, 2006.

60 FR 133. 1995. "Endangered and Threatened Species; Bald Eagle Reclassification." Final Rule. *Federal Register*. 50 CFR part 17. Fish and Wildlife Service Interior, pp. 35999–36010.

82 *Oklahoma Statutes* 21 part 1452. 1970. "Preservation of Certain Free-flowing Streams and Rivers—Designation of Scenic River Areas," as amended. Waters and Water Rights. Scenic River Act. Oklahoma Legislative Information System. Available via http://www.lsb.state.ok.us/. Accessed March 28, 2006.

7 USC 100 parts 7201 et seq. 1998. "Federal Agriculture Improvement and Reform Act of 1996," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 1 parts 431–433. 2003. "Antiquities Act of 1906," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 1 parts 461–467. 1935. "Historic Sites, Buildings, and Antiquities Act," *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 1A part 470. 2000. "National Historic Preservation Act of 1966," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 1B parts 470aa–470mm. 2002. "Archaeological Resources Protection Act of 1979," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 23 parts 1131 et seq. 1964. "National Wilderness Preservation System."*United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 28 parts 1271–1287. 1968. "Wild and Scenic Rivers," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 35 parts 1531 et seq. 1988. "Endangered Species Act of 1973," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 58 part 3831. 1996. "Conservation Reserve," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

25 USC 32 parts 3001 et seq. 1990. "Native American Graves Protection and Repatriation Act," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

33 USC 26 parts 1251 et seq. 2000. "Federal Water Pollution Control Act of 1972," commonly referred to as the *Clean Water Act*, as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

42 USC 21 part 1996. 1994. "American Indian Religious Freedom Act of 1978," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

42 USC 55 parts 4321 et seq. 2000. "National Environmental Policy Act of 1969," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

42 USC 85 parts 7401 et seq. 1999. "Clean Air Act," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

AFS. 2005. Oklahoma Game Fishes and Oklahoma Rare Fishes. Oklahoma Chapter, American Fisheries Society. Available via http://www.sdafs.org/OKAFS/Fishes%20of%20Oklahoma.htm. Accessed January 17, 2006.

Anderson, S. and R. Masters. 2004. Water Resources Series: Riparian Forest Buffers. Oklahoma Cooperative Extension Fact Sheets. Oklahoma Cooperative Extension Service, Division of Agricultural Sciences and Natural Resources, Oklahoma State University. Available via http://pods.dasnr.okstate.edu/docushare/dsweb/View/Collection-255. Accessed January 25, 2006.

ASWM. 2004. State Wetlands Program: Oklahoma. Association of State Wetland Managers. Available via http://www.aswm.org/index.htm. Accessed January 24, 2006.

Baxter, S. 1986. *Resource Protection Planning Project: The European Ethnic Experience in Oklahoma, 1870–1920*. Oklahoma Historic Preservation Survey, Department of History, Oklahoma State University. Available via http://www.ok-history.mus.ok.us/shpo/Region1Ethnic.pdf. Accessed February 21, 2006.

BEA. 2005. CA45—Farm Income and Expenses. Local Area Personal Income. Regional Economic Accounts. Bureau of Economic Analysis, U.S. Department of Commerce. Available via http://www.bea.doc.gov/. April. Accessed January 26, 2006.

Bidwell, T.G. 2005. Management of the Wild Turkey in Oklahoma. Oklahoma Cooperative Extension Fact Sheet. Oklahoma Cooperative Extension Service, Division of Agricultural Sciences and Natural Resources, Oklahoma State University. Available via http://pods.dasnr.okstate.edu/docushare/dsweb/View/Collection-311. Accessed January 10, 2006.

BLS. 2005. Customized Table. Local Area Unemployment Statistics. Bureau of Labor Statistics, U.S. Department of Labor. Available via http://www.bls.gov/data/. August 31. Accessed January 30, 2006.

Bureau of Land Management. 2005. Paleontological Overview for the Western United States. Supporting report for *Draft Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report*. Available via http://www.blm.gov/nhp/spotlight/VegEIS/. November. Accessed January 19, 2006.

Burger, L.D., L.W. Burger, Jr., and J. Faaborg. 1994. "Effects of prairie fragmentation on predation on artificial nests." *Journal of Wildlife Management* 58:249–254.

CEQ. 1997a. "Environmental Justice: Guidance Under the National Environmental Policy Act." Council on Environmental Quality, Executive Office of the President. Available via http://ceq.eh.doe.gov/nepa/regs/guidance.html. December 10. Accessed February 24, 2006.

CEQ. 1997b. "Considering Cumulative Effects under the National Environmental Policy Act." Council on Environmental Quality, Executive Office of the President. Available http://ceq.eh.doe.gov/nepa/nepanet.htm. January. Accessed February 24, 2006.

CWS and FWS. 2005. *Draft International Recovery Plan for the Whooping Crane*. Recovery of Nationally Endangered Wildlife (RENEW) Program. Canadian Wildlife Service and U.S. Fish and Wildlife Service. Available via http://ecos.fws.gov/docs/recovery_plans/2005/050111.pdf. Accessed December 21, 2005.

EPA. 2006a. Sole Source Aquifer Protection Program Overview. Environmental Protection Agency. Available via http://www.epa.gov/OGWDW/swp/ssa.html. Accessed March 31, 2006.

EPA. 2006b. Green Book: Non-attainment Areas for Criteria Pollutants. Environmental Protection Agency. Available via http://www.epa.gov/ebtpages/airairqunonattainment.html. Accessed January 18, 2006.

EPA. 2005a. Designated Sole Source Aquifers in Region VI. Environmental Protection Agency. Available via http://www.epa.gov/safewater/swp/ssa/reg6.html. Accessed January 23, 2006.

EPA. 2005b. Overview of Current Total Maximum Daily Load—TMDL—Program and Regulations. Environmental Protection Agency. Available via http://www.epa.gov/owow/tmdl/overviewfs.html. Accessed January 19, 2006.

EPA. 2002a. 2002 Section 303(d) List Fact Sheet for Oklahoma. Total Maximum Daily Load Reports. Environmental Protection Agency. Available via http://oaspub.epa.gov/waters/state_rept.control?p_state=ok. Accessed January 20, 2006.

EPA. 2002b. Drinking Water Pathogens and Their Indicators: A Reference Resource. Information Collection Rule. Envirofacts. Environmental Protection Agency. Available via http://www.epa.gov/enviro/html/icr/gloss_path.html. Accessed January 23, 2006.

EPA. 1997. Volunteer Stream Monitoring: A Methods Manual. Monitoring and Accessing Water Quality. Environmental Protection Agency. Available via http://www.epa.gov/owow/monitoring/volunteer/stream/. Accessed January 23, 2006.

Feather, P., D. Hellerstein, and L. Hansen. 1999. "Economic Valuation of Environmental Benefits and the Targeting of Conservation Programs: The Case of the CRP." Agricultural Economic Report 778. Resource Economics Division, Economic Research Service, U.S. Department of Agriculture. Available via http://www.ers.usda.gov/Briefing/ConservationAndEnvironment/morereading.htm. April. Accessed February 24, 2006.

FSA. 2006. Conservation Reserve Enhancement Program (CREP) Questions & Answers. Farm Service Agency, U.S. Department of Agriculture. Available via http://www.fsa.usda.gov/dafp/cepd/crepqnas.htm. Accessed February 24, 2006.

FSA. 2005. Conservation Reserve Program Monthly Summary—December 2005. CRP Contract Summary and Statistics. Farm Service Agency, U.S. Department of Agriculture. Available via http://www.fsa.usda.gov/dafp/cepd/crp_statistics.htm. Accessed January 27, 2006.

FSA. 2003a. *Conservation Reserve Program Final Programmatic Environmental Impact Statement.* Farm Service Agency, U.S. Department of Agriculture. Available via http://www.fsa.usda.gov/dafp/cepd/epb/environmental_archives.htm. Accessed February 24, 2006.

FSA. 2003b. *Agricultural Resources Conservation Program for the State and County Offices.* Rev. 4. Farm Service Agency, U.S. Department of Agriculture. Washington, DC. May 1. 152 pp. and 48 exhibits.

FSA. 1997. *Farm Service Agency Strategic Plan 1997–2002.* Farm Service Agency, U.S. Department of Agriculture. Available via http://www.fsa.usda.gov/pas/stratplans/fsastrat.pdf. Accessed February 24, 2006.

FWS. 2005. Listings by State and Territory. Threatened and Endangered Species System (TESS). U.S. Fish and Wildlife Service. Available via http://ecos.fws.gov/tess_public/TESSWebpage UsaLists?state=all. Accessed December 20, 2005.

FWS. 2004a. U.S. Fish and Wildlife Service Species Assessment and Listing Priority Assignment Form: Arkansas Darter (*Etheostoma cragini*). U.S. Fish and Wildlife Service. Available via http://ecos.fws.gov/species_profile/servlet/gov.doi.species_profile.servlets.SpeciesProfile?spcode=E06H. Accessed December 22, 2005.

FWS. 2004b. U.S. Fish and Wildlife Service Species Assessment and Listing Priority Assignment Form: Neosho Mucket (*Lampsilis rafinesqueana*). U.S. Fish and Wildlife Service. Available via http://ecos.fws.gov/species_profile/servlet/gov.doi.species_profile.servlets.SpeciesProfile?spcode=F00F. Accessed December 28, 2005.

FWS. 1996. *Piping Plover (*Charadrius melodus*), Atlantic Coast Population, Revised Recovery Plan.* U.S. Fish and Wildlife Service. Available via http://ecos.fws.gov/docs/recovery_plans/1996/960502.pdf. Accessed February 1, 2006.

FWS. 1995. *Ozark Big-eared Bat (*Corynorhinus townsendii ingens *[Handley]) Revised Recovery Plan.* U.S. Fish and Wildlife Service. Available via http://ecos.fws.gov/species_profile/servlet/gov.doi.species_profile.servlets.SpeciesProfile?spcode=A075. Accessed December 21, 2005.

FWS. 1988. *A Recovery Plan for the Ozark Cavefish (*Amblyopsis rosae*).* U.S. Fish and Wildlife Service. Available via http://ecos.fws.gov/species_profile/servlet/gov.doi.species_profile.servlets.SpeciesProfile?spcode=E02J. Accessed December 21, 2005.

FWS. 1983. *The Indiana Bat Recovery Plan*. U.S. Fish and Wildlife Service. Available via http://ecos.fws.gov/species_profile/servlet/gov.doi.species_profile.servlets.SpeciesProfile?spcode=A000. October 14. Accessed December 20, 2005.

FWS and USCB. 2001. *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*. U.S. Fish and Wildlife Service and U.S. Census Bureau. Available via http://www.census.gov/prod/2003pubs/01fhw/fhw01-ok.pdf. Accessed February 24, 2006.

Hines, F., J. Sommer, and M. Petrulis. 1991. "How the CRP affects local economies—Conservation Reserve Program affects farmers and farm communities—U.S. Dept. of Agriculture, Economic Research Service report." *Agricultural Outlook*. Available via http://www.findarticles.com/p/articles/mi_m3778/is_1991_Sept/ai_12059657. September. Accessed February 24, 2006.

Jaeger, L. 2002. *Tribal Court Development: Alaska Tribes*. 3d ed. Fairbanks, AK: Tanana Chiefs Conference, Inc. Available via http://thorpe.ou.edu/AKtribalct/index.html. Accessed February 24, 2006.

Lambeth, M. 2002. "Oklahoma's Booming Deer Herd." *Oklahoma Game and Fish*. Available via http://www.oklahomagameandfish.com/hunting/whitetail-deer-hunting/ok_aa074103a/index.html. Accessed January 9, 2006.

Leeds, R., L.C. Brown, M.R. Sulc, and L. VanLieshout. 1994. Vegetative Filter Strips: Application, Installation and Maintenance. Fact Sheet AEX-467-94. Food, Agricultural and Biological Engineering. Ohio State University Extension. Available via http://ohioline.osu.edu/lines/fs-list.html. Accessed January 26, 2006.

National Park Service. 2000. Geologic Provinces of the United States. Available http://www2.nature.nps.gov/geology/usgsnps/province/province.html. Accessed January 18, 2006.

NRCS. 2006. Oklahoma Conservation Programs. Natural Resources Conservation Service, U.S. Department of Agriculture. Available via http://www.ok.nrcs.usda.gov/programs/. Accessed February 12, 2006.

NRCS. 2000. Filter Strips: Conservation Reserve Enhancement Program, CREP-CP21. Natural Resources Conservation Service, U.S. Department of Agriculture. Available via http://www.michigan.gov/documents/mda_CP-21_FILTERSTRIPS_9617_7.pdf. October. Accessed January 25, 2006.

NRCS. 1994. The Phosphorus Index: A Phosphorus Assessment Tool. Technical Resources. Natural Resources Conservation Service, U.S. Department of Agriculture. Available via http://www.nrcs.usda.gov/technical/ECS/nutrient/pindex.html. Accessed January 23, 2006.

NRHP. 2006. Oklahoma State Listing of Historic Places by County. National Register of Historic Places. Available via http://www.nationalregisterofhistoricplaces.com/welcome.html. Accessed February 10, 2006.

OAS. 2006. Timeline of Oklahoma Prehistory. Glimpses into Oklahoma's Past. Oklahoma Archeological Survey. Available via http://www.ou.edu/cas/archsur/home.htm. Accessed February 10, 2006.

ODEQ. 2003. Oklahoma Air Monitoring Network. Air Quality Division, Oklahoma Department of Environmental Quality. Available via http://www.deq.state.ok.us/AQDnew/monitoring/index.htm. Accessed January 18, 2006.

ODEQ. 2002a. *The State of Oklahoma 2002 Water Quality Assessment Integrated Report.* Oklahoma Department of Environmental Quality. Available via http://www.deq.state.ok.us/WQDnew/pubs.html. Accessed February 7, 2006.

ODEQ. 2002b. General Permit OKR10 For Storm Water Discharges from Construction Activities Within the State of Oklahoma. Oklahoma Department of Environmental Quality. Available via http://www.deq.state.ok.us/WQDnew/genpermits.html. Accessed April 24, 2006.

ODWC. 2005a. Oklahoma's Comprehensive Wildlife Conservation Strategy. Oklahoma Department of Wildlife Conservation. Available via http://www.wildlifedepartment.com/CWCS.htm. July. Accessed January 9, 2006.

ODWC. 2005b. Oklahoma's 2005-2006 Hunting Season Regulations and Hunting Guide. Oklahoma Department of Wildlife Conservation. Available via http://www.wildlifedepartment.com/hunting.htm. Accessed January 17, 2006.

ODWC. 2005c. Oklahoma's Endangered and Threatened Species and Species of Special Concern. Natural Resources Section, Oklahoma Department of Wildlife Conservation. Available via http://www.wildlifedepartment.com/endanger.htm. Accessed December 20, 2005.

ODWC. 2005d. Management Areas Descriptions and Important User Information. Wildlife Management Areas. Oklahoma Department of Wildlife Conservation. Available via http://www.wildlifedepartment.com/wmas.htm. Accessed January 19, 2006.

ODWC. 2004a. 2004 Deer Harvest Totals. Deer Harvest Totals. Oklahoma Department of Wildlife Conservation. Available via http://www.wildlifedepartment.com/deerharvesttotals.htm. Accessed January 9, 2006.

ODWC. 2004b. Bass Virus Found in Oklahoma. Oklahoma Department of Wildlife Conservation. Available via http://www.wildlifedepartment.com/lmbvir.htm. Accessed January 17, 2006.

OES. 2005a. Federally Listed Threatened and Endangered Species in Oklahoma by County. Threatened and Endangered Species of Oklahoma. Oklahoma Ecological Services, U.S. Fish and Wildlife Service. Available via http://www.fws.gov/ifw2es/Oklahoma/. Accessed December 20, 2005.

OES. 2005b. American Burying Beetle Historic Range and Current Distribution in Oklahoma. Oklahoma Ecological Field Service Office, Tulsa Oklahoma. U.S. Fish and Wildlife Service. Available via http://www.fws.gov/ifw2es/Oklahoma/beetle1.htm Accessed April 10, 2006.

OKGenWeb. 2003. Tribes and Nations of Oklahoma and Indian Territories. Oklahoma Genealogy. Available via http://www.rootsweb.com/~okgenweb/maps/itmap.htm. June 6. Accessed February 16, 2006.

OSHPO. 2005a. *Oklahoma's National Register Handbook.* Oklahoma State Historic Preservation Office. Available via http://www.ok-history.mus.ok.us/shpo/NRHANDBK.htm. December 31. Accessed February 16, 2006.

OSHPO. 2005b. *Tomorrow's Legacy: Oklahoma's Statewide Preservation Plan.* Oklahoma State Historic Preservation Office. Available via http://www.ok-history.mus.ok.us/shpo/legacy2005.htm. Accessed February 13, 2006.

OSRC. 1999. *The Illinois River Management Plan.* Oklahoma Scenic Rivers Commission. Available via http://www.scenicrivers.state.ok.us/programs_next3.asp. Accessed January 19, 2006.

OWRB. 1995. *1995 Update of the Oklahoma Comprehensive Water Plan.* Oklahoma Water Resources Board. Available via http://www.owrb.state.ok.us/supply/ocwp/ocwp1995.php. Accessed January 20, 2006.

Ryder, P.D. 1996. Groundwater Atlas of the United States—Oklahoma, Texas. U.S. Geological Survey Report HA 730-E. Available via http://capp.water.usgs.gov/gwa/ch_e/index.html. Accessed January 18, 2006.

Stevens, R.L. 1999. The Feral Hog in Oklahoma. Ardmore, OK: The Samuel Roberts Nobel Foundation. Available via http://www.noble.org/Ag/Wildlife/FeralHogs/Index.htm. Accessed January 10, 2006.

University of Idaho. 2006. The Twelve Soil Orders. Soil Taxonomy. Soil and Land Resources Division. College of Agricultural and Life Sciences. University of Idaho. Available via http://soils.ag.uidaho.edu/soilorders/orders.htm. Accessed February 24, 2006.

USACE. 1987. *Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual.* Wetlands Research Program Technical Report Y–87–1 (on-line edition). Environment Laboratory, Waterways Experiment Station, U.S. Army Corps of Engineers. Available via http://www.saj.usace.army.mil/permit/documents/87manual.pdf. January. Accessed January 24, 2006.

USCB. 2001. *Overview of Race and Hispanic Origin.* Census 2000 Brief. U.S. Census Bureau. Available via http://www.census.gov/prod/2001pubs/c2kbr01-1.pdf. March. Accessed February 24, 2006.

USCB. 2000a. State and County QuickFacts. U.S. Census Bureau. Available via http://quickfacts.census.gov/qfd/states/00000.html. Accessed January 31, 2006.

USCB. 2000b. Census 2000 Demographic Profiles. Fact Sheet. U.S. Census Bureau. Available via http://factfinder.census.gov/. Accessed January 24, 2006.

USCB. 2000c. P2—Urban and Rural. Detailed Table. Census 2000 Summary File 1 (SF 1) 100-Percent Data. Data Sets. U.S. Census Bureau. Available via http://factfinder.census.gov/. Accessed January 24, 2006.

USCB. 1995. *Poverty Areas.* Statistical Brief. U.S. Census Bureau. Available via http://www.census.gov/population/socdemo/statbriefs/povarea.html. June. Accessed September 29, 2004.

USCB. 1990a. P001—Persons. Detailed Table. 1990 Summary Tape File 1 (STF 1) 100-Percent Data. Data Sets. U.S. Census Bureau. Available via http://factfinder.census.gov/. January 24, 2006.

USCB. 1990b. P004—Urban and Rural. Detailed Table. 1990 Summary Tape File 1 (STF 1) 100-Percent Data. Data Sets. U.S. Census Bureau. Available via http://factfinder.census.gov/. Accessed January 24, 2006.

USDA. 2005. Oklahoma Annual Statistics Bulletin—2004. National Agricultural Statistics Service. U.S. Department of Agriculture. Available via http://www.nass.usda.gov/Statistics_by_State/Oklahoma/Publications/Annual_Statistical_Bulletin/index.asp. September. Accessed January 27, 2006.

USDA. 2004. "Volume 1 Chapter 2: Oklahoma County Level Data." *2002 Census of Agriculture.* National Agricultural Statistics Service. U.S. Department of Agriculture. Available via http://www.nass.usda.gov/census/census02/volume1/ok/index2.htm. June. Accessed January 24, 2006.

USDA. 2003. Oklahoma Annual Statistics Bulletin—2002. National Agricultural Statistics Service. U.S. Department of Agriculture. Available via http://www.nass.usda.gov/Statistics_by_State/Oklahoma/Publications/Annual_Statistical_Bulletin/index.asp. September. Accessed January 27, 2006.

USGS. 2004. Geologic Provinces of the United States: Records of an Active Earth. Available via http://wrgis.wr.usgs.gov/docs/parks/province/index.html. Accessed January 24, 2006.

Welsch, David J. 1991. Riparian Forest Buffers: Function and Design for Protection and Enhancement of Water Resources. U.S. Forest Service Report NA-PR-07-91. Forest Resources Management, Northeastern Area. Available via http://www.na.fs.fed.us/spfo/pubs/n_resource/riparianforests/index.htm. Accessed January 26, 2006.

Woods, A.J., J.M. Omernik, D.R. Butler, J.G. Ford, J.E. Henley, B.W. Hoagland, D.S. Arndt, and B.C. Moran. 2005. Ecoregions of Oklahoma. Color poster with map, descriptive text, summary tables, and photographs. U.S. Geological Survey. Reston, Virginia. Map scale 1:1,245,000. Available via http://www.epa.gov/wed/pages/ecoregions/ok_eco.htm. Accessed January 4, 2006.

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APPENDIX A
OKLAHOMA CONSERVATION RESERVE ENHANCEMENT PROGRAM AGREEMENT

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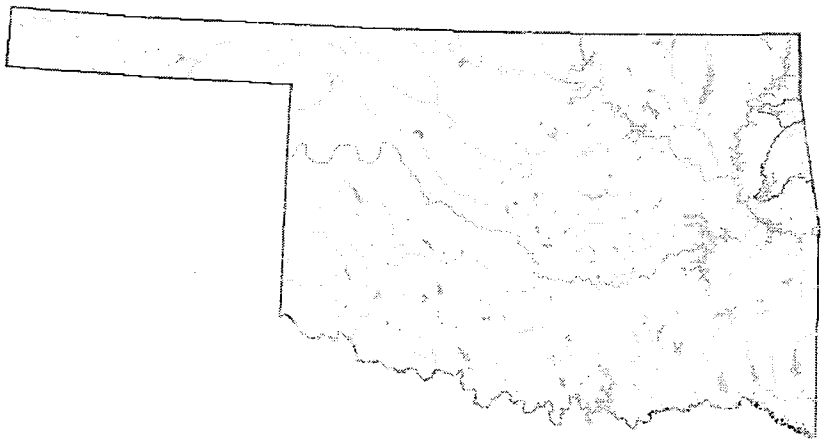
APPENDIX A—OKLAHOMA CONSERVATION RESERVE ENHANCEMENT PROGRAM AGREEMENT

The following pages of this appendix contain scanned images of the *Conservation Reserve Enhancement Program (CREP) Proposal for Spavinaw Lake and Illinois River/Lake Tenkiller Watersheds*. This draft agreement, dated January 2006, is between the U.S. Department of Agriculture Commodity Credit Corporation and the State of Oklahoma.

Conservation Reserve Enhancement Program (CREP) Proposal for Spavinaw Lake and Illinois River/Lake Tenkiller Watersheds

State of Oklahoma

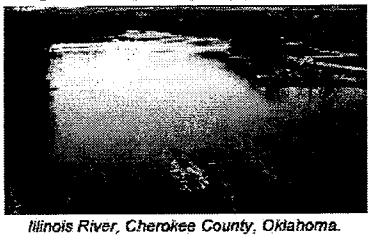
Cherokee, Delaware, Sequoyah, Adair, and Mayes Counties



Section 1- Abstract

Project Area Description

Oklahoma has chosen two high priority watersheds in the eastern portion of the State as the focus of a CREP program. These watersheds were chosen because they are high priorities for the State, but also because the water quality problems and sources of contaminants are representative of their regions and of problems that can be significantly addressed with protection of riparian areas.



Illinois River, Cherokee County, Oklahoma.

The Spavinaw Lake and Lake Tenkiller (Illinois River) Watersheds lie within the Ozark Plateau. Land is level to highly dissected and is underlain by cherty limestone. Karst features and clear, spring-fed perennial streams are common. These clear or once-clear rivers and lakes are highly valued by the citizens of Oklahoma for recreation and water supply. The reservoirs in particular are important water supplies for much of eastern Oklahoma including the greater Tulsa metropolitan area. A large recreational industry exists on the Illinois River and its main tributaries, the Baron Fork River and Flint Creek.

This project aims to restore stable riparian vegetation and riparian buffers to these systems and to reduce livestock access to floodplains. This will result in less overland flow of pathogens (fecal indicator bacteria) and phosphorus to the streams and will stabilize the stream banks, resulting in less streambank erosion. This, in turn, will result in better water quality, lower maintenance requirements to the road and highway system, and will help to preserve existing floodplain pasture.

The watersheds of Spavinaw and Tenkiller Lakes constitute a major poultry growing and cattle producing area. Poultry litter has been applied to the nutrient poor, thin, cherty soils of the area and they now grow luxuriant grass and support an important cattle industry. Excessive buildup of phosphorus over the years has polluted the receiving waterbodies to the point that they are now considered impaired by nutrients. The Illinois River is impaired by phosphorus and many of the area streams are impaired by pathogenic bacteria. Downstream reservoirs are impaired by phosphorus (high chlorophyll-a concentrations) and low dissolved oxygen levels, primarily due to excess nutrients.

This program will attempt to protect 4,700 – 19,035 acres of riparian area in the two watersheds (depending on available non-federal match), with a total riparian area of approximately 118,000 acres (2,060 square miles of total watershed area). Practices to be used include CP21 and CP22 with modifications.

Total project cost is estimated between $15,227,500 and $54,619,702 of which approximately 20% will be bourn by non-federal partners.

Section 2 – Existing Conditions and Impacts to be Addressed

Existing Conditions

Lake Spavinaw and upstream Lake Eucha provide approximately 50% of the drinking water for the greater Tulsa Metropolitan area and were constructed and operated for that purpose. Water quality has been steadily deteriorating as algal growth has increased over the years. The Tulsa Metropolitan Utility Authority has recorded increasing numbers of taste and odor complaints with their finished water and concomitant increased treatment costs. They recently sued several of the large poultry integrator companies who contract with the poultry growers of the watershed. The suit was settled with the result that there is now less poultry waste spread in the watershed but the water quality problems persist. Computer modeling highlights the need for riparian buffers to fully address this problem.

Algae bloom on Spavinaw Lake

Aside from the above-mentioned problems with drinking water produced from this lake, the lake itself does not meet water quality standards because of excess phosphorus in the streams feeding it. Large portions of the lake are now anoxic for much of the summer and taste and odor problems due to blue green algae blooms are now occurring. It is feared that fish kills may follow and that toxic algae blooms could be a possibility. Aside from the loss of the fishing resource and additional problems for the water treatment plant that would occur if this were to happen, large fish kills would be detrimental to the area in general. Agricultural producers in the area have already been subjected to significant regulations relating to the use of poultry litter and nutrient management and further water quality degradation will likely result in increased regulation on the industry. Agriculture is a very important industry to the State and as such, it is critical that we take steps to reduce potential impacts from agricultural practices.

Lake Tenkiller is a large multipurpose reservoir operated by the Army Corps of Engineers on the Illinois River. The lake is one of the most popular recreation destinations in the state and there is a sizeable associated tourism industry. The lake was once popular with SCUBA divers, but declining water clarity has dramatically reduced that activity. The lake has recently been classified as impaired due to anoxia that is occurring. The Illinois River and its two major tributaries, Flint Creek and Baron Fork River, are Scenic Rivers, considered by Oklahomans to be among the finest rivers in the state. They support a very large recreational industry in the form of canoeing, rafting, and camping. The Illinois River, Flint Creek and the Baron Fork River are all violating water quality standards for phosphorus and the State Attorney General has recently submitted a notice of intent to sue five poultry integrator companies for their role in polluting these rivers.

Oklahoma has adopted a 0.037 mg/L phosphorus standard for the Illinois and other State Scenic Rivers. Arkansas, in a show of good faith to help meet the standard, agreed to upgrade sewage treatment for the cities of Siloam Springs, Springdale, Fayetteville, Bentonville, and Rogers to meet 1 milligram per liter phosphorus limits. The two states are working cooperatively to develop a joint monitoring strategy and a joint watershed plan for the Scenic River watersheds. As a result of these efforts, point sources in the watershed have been largely addressed; remaining efforts must focus on reduction of nonpoint source pollution.

In addition to the phosphorus pollution, the scenic rivers are impaired by pathogenic bacteria, many of which wash into the streams from poultry litter applied to pastures or cow manure deposited on floodplains or in streams. Additional potential sources of bacteria include septic systems and wildlife. The Clean Water Act demands that the state take action to remove this impairment and the state strongly wishes to do so by voluntary means.

The deterioration of water quality in our scenic rivers, major reservoirs and now a lawsuit has polarized our state into agricultural interests versus recreational interests, environmental and drinking water interests. The State of Oklahoma has entered negations with the State of Arkansas to avoid another threatened lawsuit that Oklahoma feels it may be forced to file if water quality upstream of the state boundaries doesn't improve. This discord has a negative impact on the State's agricultural industry that could result in irreparable harm. Modeling has shown that with properly functioning riparian buffers in place, we can substantially reduce inputs of pollutants to streams and rivers and ultimately, to the reservoirs. Riparian buffers, coupled with upland nutrient reduction practices and nutrient reduction technology applied to wastewater treatment plants should be able to solve the problem.

Map of the Area

The proposed CREP program would focus on riparian area in the Oklahoma portion of two eastern high priority watersheds.

The State believes that demonstrating the efficiency of riparian buffers in these two high priority watersheds is a critical step in reaching our ultimate goal of landowners accepting riparian protection as a standard practice of operation, much like terraces on a sloped field, or septic tanks for a rural residence.

Description of Human Activities and Landuses

The Illinois River and its major tributaries are Scenic Rivers that host a significant recreational industry in the form of canoe and raft rentals as well as camping, fishing and swimming. Other than this recreational use, activities and landuses in the Illinois River and Spavinaw watersheds are the same and they can be discussed as one unit.

Hunting is an important activity throughout the upland areas of forest, which are mostly privately owned. Cleared land is almost exclusively devoted to pastures of Bermuda grass and Fescue. Acres of cropland in the watersheds have steadily declined, with most of the cropland converted to pasture. Compared to the 1984 landuse coverages detailed in the following table and maps, currently, there are only a few hundred acres of cropland in the Oklahoma portion of the two watersheds, most of which are in soybeans as well as minor amounts of orchards.

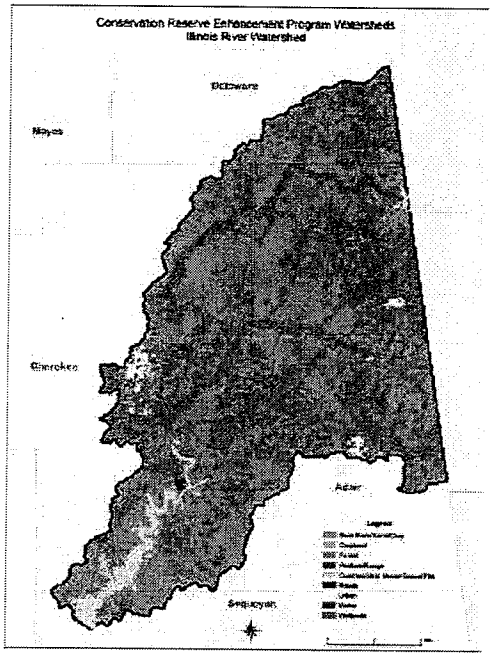
Poultry and cattle production are the base of most of the agricultural economic activity in the area. The two watersheds together produce over 10,000,000 birds/year (2000 Ag. census), and the litter resulting from their production, when applied to land, allows the nutrient poor soils to grow abundant grass for cattle grazing. Oklahoma Department of Agriculture, Food, and Forestry permitting records suggest that the two watersheds have a total of 190 houses with a combined capacity of over 14,000,000 birds/yr . Both beef and dairy cattle are important agricultural products of the area. Approximately 180,000 and 13,000 respectively of beef and dairy cattle are produced annually in the watersheds.

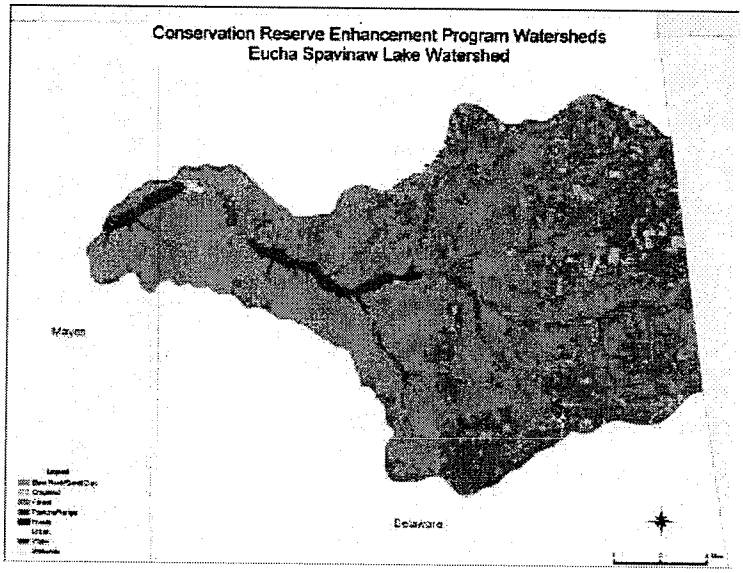
Tahlequah (2000 population: 14,458) is the only urban center in the Oklahoma portion of the Illinois River watershed. Tahlequah is the county seat of Cherokee County, Oklahoma. Jay, Oklahoma, situated on the ridgeline of the Spavinaw Lake Watershed, is the county seat of Delaware County and has a population of 7,332 (2000 census).

Further illustration of landuse distribution in the watersheds can be seen in the following landuse table and maps.

Landuse Summaries in Proposed CREP Watersheds (1984 USGS Land Use Data).

Land Use	Illinois River- OK portion (acres)	Eucha/Spavinaw – OK portion (acres)
Bare rock / Sand / Clay	266	160
Cropland	11,022	8,140
Forest	324,758	101,878
Pasture/Range	213,539	57,494
Gravel Pits	34	0
Roads	1,966	142
Urban	6,099	298
Water/Wetlands	18,346	5,257
Total	576,030	173,369





Draft Oklahoma CREP Proposal- Illinois River/Lake Tenkiller and Spavinaw Lake Watersheds- 01/06 Page5

Farm Demographics- 2002 Agricultural Census

Item	Adair	Cherokee	Delaware
Number of Farms	1,130	1,221	1,393
Average Size of Farms (acres)	211	181	203
Average Farm Production Expenses	$55,394	$52,139	$70,190
Average Farm Net Income	$15,582	$23,250	$23,646
Average age of operator	54.6	55.7	54.7
Farming	619	683	794
Other	511	538	599
Male	1,021	1,103	1,255
Female	109	118	138
Cattle	59,033	45,573	74,719
Chickens	2,695,327	688,523	6,748,447
Swine			
Sheep			
Turkey		184,250	
Horses	2,077	2,591	
Forage	38,312	38,450	59,484
Wheat	1,642		2,868
Vegetables	402		
Peanuts			
Grain Sorghum			642
Corn	195		
Nursery Stock		1,270	
Pecans		446	
Soybeans			1,790
Field & Grass Seed			590
Berries		28	
Rye			

Environmental Factors

Average precipitation in the Tenkiller and Spavinaw Lake watersheds is approximately 45 inches/year. Landforms are mostly moderately to highly dissected portions of the Ozark Plateau with narrow ridge tops separated by steep v-shaped valleys. Lesser amounts of nearly level un-dissected plateau also occur. Karst features occur and springs are common. Most smaller streams are perennial and the base flow, consisting largely of spring water, is clear and cool. Larger streams and rivers are also clear but their spring-fed base flow is also supplemented by point sources of treated effluent.

The area is mantled by quaternary cherty clay solution residuum. Most areas are underlain by Mississippian age limestone and chert with Devonian age limestones and shales exposed in the deeper valleys. Common soil series on uplands include Bodine, Baxter, Eldorado, Craig, Jay, Captina, Clarksville and Etowah. Common series on floodplains include Huntington, Staser, Elsah and Sallisaw. Soils on slopes can be very cherty.

The area includes the Springfield Plateau and the Dissected Springfield Plateau Ecoregions. Most of the natural vegetation is Oak-Hickory and Oak-Hickory-Pine forest. Predominant trees on the uplands include black, white, blackjack, northern red and post oaks, various elms, sugar maple and shortleaf pine. Dominant trees on floodplains are sycamore, American and red elm, willows, silver maple, box elder and river birch.

The clear, cool spring fed streams are important biological resources in the state and the larger ones are important as recreational resources. Three of the state's five scenic rivers are contained in this area and have large well-developed recreational industries centered on canoeing, rafting, swimming, and camping. Lake Tenkiller is one of the two highest recreational use lakes in the state and there are many vacation and summer homes in the area. Spavinaw Lake and upstream Lake Eucha provide nearly 50% of the water for the Tulsa metropolitan area as well as to the town of Jay. Tahlequah draws its water directly from the Illinois River and many other towns and rural water districts throughout the area draw water from Lake Tenkiller and the rivers that feed it.

Air quality is good and although pollution from the upwind population centers of the state is sometimes evident, the area does not experience any air quality alerts.

Federally listed endangered species occur in the area including the Ozark Cavefish, the Gray Bat, Ozark Big-eared Bat, and the Bald Eagle.

Section 3 - Agricultural Related Environmental Impacts

Throughout the last several decades, the poultry industry has achieved remarkable success in this area of Oklahoma and in northwestern Arkansas where these streams and rivers arise, and is a critical part of the State and local economy. Through application of poultry litter to once infertile areas of native pasture or forest, a very successful beef cattle industry has grown alongside of the poultry industry. Pastures fertilized with poultry litter are highly productive. Many floodplain forests have been converted to pasture in order to increased forage production, and in the process, many streamside riparian areas have been cleared and converted to pasture also.

Over the years, water quality in Tenkiller, Spavinaw, and Eucha lakes has declined for reasons related to excessive algal growth. Clarity has declined dramatically, oxygen levels have fallen, and taste and odor complaints about finished water produced from these reservoirs have increased. Lake Tenkiller and the entire Illinois River are on the state's 303d list of impaired waters with excessive phosphorus listed as the cause of the problem as are Lakes Eucha and Spavinaw for the same reason.

Causes of Impairments (303(d) Listed Waters) in the Illinois River and Spavinaw Watersheds (2002 Integrated Report).

OKWBID	NAME	Watershed	Cause(s) of Impairment
OK121600050020_00	Spavinaw Lake	Eucha/Spavinaw	low DO, phosphorus
OK121600050070_00	Eucha Lake	Eucha/Spavinaw	low DO, phosphorus
OK121600050150_00	Beaty Creek	Eucha/Spavinaw	pathogens
OK121700020020_00	Tenkiller Ferry Lake	Illinois River	low DO, phosphorus
OK121700020110_00	Chicken Creek	Illinois River	causes unknown (poor fish collection)
OK121700030010_00	Illinois River	Illinois River	pathogens, phosphorus
OK121700030040_00	Tahlequah Creek (Town Branch)	Illinois River	pathogens
OK121700030280_00	Illinois River	Illinois River	phosphorus
OK121700030350_00	Illinois River	Illinois River	pathogens, phosphorus, turbidity
OK121700040010_00	Caney Creek	Illinois River	pathogens, turbidity
OK121700050010_00	Illinois River, Baron Fork	Illinois River	pathogens, phosphorus
OK121700060010_00	Flint Creek	Illinois River	pathogens, phosphorus
OK121700060090_00	Sager Creek	Illinois River	nitrate, pathogens

Clean Water Act (CWA) section 314 Clean Lakes Studies have been completed on both Tenkiller and Eucha as well as several other similar studies. The watersheds have been intensively monitored and both systems have been modeled. The results are clear: poultry litter and cattle manure are a significant source of the phosphorus that is causing the problems in these waterbodies. A series of lawsuits and threatened lawsuits have resulted in agreements to substantially reduce the phosphorus content of the wastewater discharged to these two watersheds from point sources. A lawsuit wherein the City of Tulsa sued the poultry integrator companies has reduced the amount of litter that is spread in the Eucha/Spavinaw watershed and the EQIP program and the State's EPA CWA 319 program have helped install many best management practices (BMPs) to reduce the phosphorus content in water running off of farms in the watersheds. At this time, over $3 million dollars of state, federal and landowner monies have been spent in these two watersheds through the 319 program. The USDA has also contributed $3,366,692 to reduce nutrient runoff through the EQIP federal programs. However, much remains to be done to restore these waterbodies so that they are attaining water quality standards.

Currently, the entire length of the Illinois River from Tenkiller Lake to the Arkansas state line is shown as impaired on Oklahoma's 2002 303(d) List of waters not attaining water quality standards. A majority of the river is listed for excessively high levels of phosphorus and human pathogens (fecal indicator bacteria). Flint Creek and the Baron

Fork are listed for pathogens and phosphorus in their entirety. Spavinaw and Beaty Creeks, the two main tributaries of Lake Eucha, are listed for pathogens and Spavinaw Creek is listed for phosphorus. Point source dischargers are under heavy scrutiny in the area and most have upgraded to tertiary treatment. This investment in point source upgrades has been accompanied by increasing pressure to address nonpoint sources of pollution in the watersheds.

During the first half of the 20th century, agricultural land use in both the Illinois River and the Spavinaw Creek basins was farming of corn, wheat, and oats and dairy production. Apple and Peach orchards were abundant. Nearly 80% of the area was in timber during this time. During the last half of the 20th century, crop farming has virtually disappeared and commercial poultry has become the dominant industry today with the production of beef cattle running second. Timber currently comprises about 50% of the land area. Most of the decrease in timber area is due to creation of pasture for livestock.

Section 4 - Project Objectives

The primary objective of a CREP program in these State priority watersheds would be to reduce nutrient and sediment inputs to these waterbodies through restoration of riparian buffers. The State has implemented 319 projects in both of these watersheds and demonstrated that landowners were receptive to riparian buffers. In addition, water quality monitoring associated with one of these programs has shown a reduction in phosphorus loading due to the implementation of practices.

The table below provides an estimate of the load reductions for each individual watershed, and for the two watersheds in total, that could result from implementation of this CREP program. These estimates were calculated using EPA's Spreadsheet Tool for Estimating Pollutant Load (STEPL) and represent a conservative estimate of the load reduction that could result from protecting at least 30% of the riparian area in these watersheds, as proposed by this program. When other factors such as the increase in contiguous protected riparian area, additional, complimentary practices that could be implemented using WRP, EQIP, and other similar programs that can be promoted by the technical support staff included in this proposal, we expect the result will be greater loading reductions than those shown below.

Potential Loading Reductions Due to Proposed CREP program in Oklahoma

Watershed	Phosphorus Reduction		Nitrogen Reduction		Sediment Reduction	
	Lbs/yr	%	Lbs/yr	%	tons/yr	%
Illinois River	138,866	30%	1,284,178	32%	17,887	29%
Lake Eucha	9,271	30%	92,765	39%	2,139	40%
Total	148,137	30%	1,376,943	32%	20,026	30%

The ultimate goal of this program is to reduce nutrient and sediment loading in the selected watersheds by the amounts described in the above table, and to establish at least 4,700 – 19,035 acres of riparian buffer in these watersheds. A secondary goal of the CREP and complimentary programs ongoing in these watersheds is to achieve a situation where producers and other landowners view riparian protection as a standard part of land management, much the way they have come to accept practices such as terracing or septic tanks. We have shown with previous programs such as 319, EQIP, and WRP that landowners in these watersheds are receptive to protecting their riparian areas and this CREP program will allow us to demonstrate to landowners the short and long-term benefits of riparian protection. Again, past performance has shown us that once landowners see real benefits, they will begin to adopt the practice on their own and we could see even greater load reductions.

Results of this program will be felt at the local level, but should also expand to have consequences outside of watershed or even State borders. All of these systems drain ultimately to the Gulf of Mexico. Hypoxia in the Gulf is a widely recognized water quality problem with far-reaching impacts on fisheries, natural resources, and the economy in general. The strategy to reduce hypoxia in the Gulf of Mexico calls for a thirty percent reduction in nitrogen loading to the gulf within the next fifteen years. Although Oklahoma is primarily concerned with phosphorus, installation of these riparian buffers will also reduce nitrogen loading originating in Oklahoma to the gulf. In addition, documented water quality improvements related to the implementation of this program will likely encourage other parts of Oklahoma, as well as other States in the region to implement programs to improve riparian buffers, further improving influent waters to the Gulf.

Section 5 - Project Description

Conservation Practices

The highest priority group of BMPs approved for cost share in all of these watersheds in the 319 programs to date is the one collectively called "riparian practices". These have been chosen as highest priority both by OCC and by local watershed advisory groups (made up of local stakeholders) assembled to recommend practices and cost-share rates for these 319 programs. These practices protect riparian buffer areas in some manner and are derived from national practices CP22 & CP21. This group also includes an additional practice of winter feeding areas necessitated by restriction of stream and ravine access to cattle. These practices include fencing to protect streams, providing stable stream crossings for livestock and in some cases equipment crossings, provision of alternative water sources away from the stream, construction of winter feeding areas to make up for lost winter shelter provided by ravines, and mechanical repair of critical stream banks that are eroding.

The federal government also has several programs whose goal is to protect water quality through protection of riparian areas. Unfortunately, these programs have not been successful as manifested by minimal enrollment on the part of eligible producers. The fact that the same producers are signing up for the state and the 319 programs is good evidence of the fact that these programs can be successful when they are modified to fit the needs of the local producers while still protecting the environment. Another important reason for the differential success of the two programs is that NRCS is limited in their ability to promote these programs due to the small size of their local staff and the multiple commitments they already have.

Using state and 319 dollars, OCC has been providing all of these practices through cost share programs in our priority watersheds for several years. We have gained valuable experience and insight into the best way to proceed given the attitude, practices and preferences of our local agricultural communities. At this point, our only limitation is lack of funds to sign up all interested agricultural producers in our programs. Initially, the practice of riparian buffer strips was not well received, but as time has passed, we have adjusted our program to fit the needs of both the environment and our producers so that it is now well accepted. Our 319 program in the Illinois River Watershed installed 1,343 acres of riparian area (approximately 2% of the degraded riparian area in the watershed) with approximately $328,000 and in a subwatershed of Eucha/Spavinaw, we installed approximately 330 acres of riparian area (approximately 5% of the degraded area in the watershed) for approximately $238,000. In several of our 319 priority watersheds, we have been sufficiently successful with demonstration and education programs such that landowners with sufficient means are installing riparian buffers without assistance from cost-share programs. However, most agricultural producers need financial assistance in order to be able to install and maintain these practices.

The CREP program allows us to tailor the program to meet the needs of both the state and the local watershed stakeholders and we believe this difference will allow us to have a very successful riparian buffer program. The proposed program will solve the manpower problem that NRCS has encountered by using state funding to hire staff in the beginning of the program that will promote the program to local producers and then write plans for those who sign up. This arrangement has proved very successful in the 319 programs. Some of our programs have had as many as 60% of the watershed landowners participate when as little as $1,000,000 was available per watershed.

A major impediment contributing to past failures has been that forested areas along the stream could not be signed up in USDA riparian programs even when they were small components of an otherwise un-forested buffer. Landowners do not want to pay for and maintain a fence at their expense as it crosses through forested areas. In the proposed Oklahoma CREP program, monies will be available to pay for fence and a reduced rental rate in forested components of a larger pasture.

Additionally, strict guidelines concerning the width of riparian buffers sometimes deter otherwise willing landowners if the configuration of the stream is such that they will have trouble maneuvering equipment within the riparian zone or maintaining fences through frequent floods. Another deterrent to participation has been the inflexibility of federal programs concerning management of riparian zones. A state designed CREP program will be able to overcome these obstacles.

OCC proposes a program that, based on our experience, will overcome all of these obstacles and be highly successful. The major components of the Oklahoma CREP program will be the same riparian practices that have proven to be successful in our 319 projects with some modification. We will prohibit or severely limit livestock access to the stream and provide alternative practices to the producer to provide all the services he was realizing from the stream.

Livestock access to streams will be limited through fence construction. In northeastern Oklahoma where the terrain is very hilly, pastures often contain many small groves of trees in small narrow ravines and other areas that physically inhibit the operation of equipment necessary to maintain the pasture. Many USDA riparian programs do not subsidize the installation and maintenance of fence through these treed areas and livestock producers have been loathe to take on this responsibility themselves. OCC proposes that the Oklahoma CREP program should cost share fence through these treed areas at the same rates that federal money cost shares fence in pasture.

Another other important addition to the Oklahoma CREP riparian program will be the addition of flexible riparian management. Some small producers simply do not have enough pasture that they can afford to lock any up in a restrictive riparian program. Flexible management options that allow limited haying at times when rain is unlikely and the stream bank is not especially vulnerable allow producers to utilize riparian forage while maintaining most or all of the benefits of a protected riparian corridor. Incentive payments for riparian land being used for hay production would be reduced an appropriate amount. In addition, haying helps remove nutrients from the riparian area and increases the chances that the nutrients are moved out of the watershed, either as hay or animal products.

OCC believes that the addition of winter feeding barns to this program is critical. The 2002 Ag census shows that average farm size for the three county area is less than 200 acres. Area farmers simply do not have the acreage required to move cattle from pasture to pasture throughout the winter in order to prevent overgrazing. The predominant practice is to assign one pasture to cattle for the winter and provide supplemental feed until grass begins growing again in April. By the end of the winter, these pastures are a trampled mess of mud and manure with no vegetation. The spring rains then wash this mixture into area streams.

To prevent this damage from occurring on a pasture and to shelter the cattle from the weather, winter feeding areas are usually located in the woods and often in a ravine. Through our 319 program, OCC has realized that we must provide some form of winter shelter to induce farmers to give up their winter feeding areas in or near forested areas and drainage ways. An additional benefit of winter feeding barns is that they allow manure to be stored out of the weather throughout the winter and then applied to areas that can benefit from it during the growing season.

Without these structures, many winter feeding areas will be moved out of riparian areas into nearby ravines where the manure/sediment mixture will still wash into streams when spring rains arrive.

Another crucial change is to allow substitution of fescue and Bermuda grass for native grasses in the herbaceous zone. There are no important native grasses in these floodplain and riparian areas because they would all naturally be forest. When native grass is planted, it is eventually overgrown and replaced by tall fescue. Additionally, since we will be encouraging farmers to maintain the herbaceous zone of the riparian area by early summer haying and most of them are very used to fescue and Bermuda culture, we think this substitution is important.

The final important difference is to allow the development of upland water to encourage the use of upland pastures for grazing and the use of lowland pastures for haying. Current practice is frequently just the opposite since the streams are perennial and make a convenient water source whereas the upland pastures frequently have no water.

<u>Adjustments from CP22 & CP21 critical to program adoption have been determined to be:</u>

1. Allow grasses in zone 3 to be fescue and Bermuda in addition to native grasses.
2. The combined width of zones 1, 2, & 3 will not exceed 30% of geomorphic floodplain or 100 feet, whichever is larger.
3. Allow haying from July 1 to August 15 provided that forage be kept above the minimum annual average residual height as stated in NRCS standards and specifications. Rental rate for CP22 or CP21 with haying allowed will be 90% of standard rate with no use of forage.

4. Small areas of grazed forest within larger pastures in mixed systems (up to and including areas that are 40% forested) will be eligible for enrollment in the program, with rental rates for forested areas set at 50% of average area pasture rental payments. Fencing that may run through these areas will be cost-shared at the standard rate.
5. Winter feeding facilities composed of a covered heavy use area combined with a dry manure storage area will be allowed at a cost share rate of 50%. These facilities will be constructed out of the geomorphic floodplain. They will be a combination of NRCS practices 561 and 313 with a roof over the heavy use area.
6. Alternative water sources may be developed within 1500 feet of the edge of zone 3 with county committee approval to encourage upland pasture use for grazing and flood plain pasture use for haying.
7. Watering facilities will allow up to 1500 feet of pipeline with county committee approval.
8. Stream crossings may be installed to allow livestock and equipment movement across a stream.
9. Pasture rental rates will be 175% of average area rates to insure adequate participation.
10. The maximum dollar amount allowed for water development, water facilities and pipeline, $3000, $2000, and $2000 respectively, will be per 0.5 miles of stream rather than per contract.

State contributions to the program will be:

1. The State of Oklahoma will provide water quality monitoring for the life of the program to document project effectiveness. This will include installation of stream flow gages and automatic samplers programmed to collect flow weighted chemical loading data. It will also include the staff to operate the equipment as well as the associated laboratory costs. Biological data on the fish and macroinvertebrate communities and aquatic habitat conditions will also be collected.
2. In the event that the federal funds cannot be used for this purpose, the State will provide rental payments of 50% of the average annual pasture rental payments for forested areas and reimburse for fencing through smaller areas of grazed forest that are within larger pastures in mixed systems that are up to and including areas that are 40% forest.
3. The state will pay the salaries, benefits, overhead and office rental fees of technicians that will both act as door to door program salesmen and also write farm plans that are acceptable to the State NRCS office.
4. State money remaining after the first 3 items in this list will be used to supplement floodplain pasture rental rates signed up with CRP under practices CP1, CP2 & CP10 in wide valleys where there is cropland beyond 30% of the geomorphic floodplain.
5. Oklahoma Department of Wildlife Conservation (ODWC) has an active fluvial geomorphology-based stream restoration program in these watersheds. Their program involves channel restoration and biological and water quality monitoring. Additional ODWC activities in the watershed include technical assistance to landowners to improve wildlife value of their riparian lands.
6. The Nature Conservancy owns and operates a 15,000 acre preserve in Cherokee and Adair Counties in Oklahoma. This land is incrementally being restored to native conditions. Riparian restoration during the CREP period may be documented as match to the overall program.

In summary, these practice modifications accomplish the following:

- Providing livestock water in upland pastures that had formerly been used for hay production so that flood plain pastures can now be used for hay production and upland pastures used for grazing;
- Allowing flexible management of riparian grassland so that it can be hayed at reduced incentive provided that proper vegetative height is present during and following times of litter application; (OCC has found that many producers who are unwilling to sign up for a program of total withholding of riparian land will sign up for a program that allows limited use of riparian land while still protecting riparian function.);
- Providing stable stream crossings for livestock and equipment; and
- Construction of winter feeding areas to replace the ravines and hollows that are currently used. The winter feeding areas allow manure to be stockpiled out of the rain (until it can properly be land applied), allow the cattle protection from the wind, and protect soil in the heavy use areas.

Project Size

The Oklahoma portion of the Lake Tenkiller watershed is approximately 575,000 acres in size and the Eucha Spavinaw watershed is approximately 230,000 acres. This program will attempt to restore 2,300 – 15,130 acres of degraded riparian area in the Lake Tenkiller watershed and 2,330-3,830 acres in the Eucha/Spavinaw watershed, depending on the amount of money available. Sufficient funding will allow the greater number of acres to be protected by including more of the small wooded grazed areas that are part of larger pastures to be

included in the program and just allowing more total acres to be signed up. The targeted area is land lying adjacent to perennial and intermittent streams that is currently in cropland, pasture, or is predominantly pasture.

Length of time for project implementation

It is anticipated that all contracts will be signed within 3 years of the project opening date. The contracts will have a 15-year lifespan.

Interagency Coordination Method

The Oklahoma CREP proposal is being developed by the Oklahoma Conservation Commission (OCC) and the state offices of NRCS and FSA. The OCC is the state Conservation District agency. The Governor's office has been represented through the participation of the Secretaries of Agriculture and Environment who both approve of and support the project. Their role, along with the Governor's, is to secure the State share of the funding, and the funding is included in the Governor's recommended budget this year. Currently, the funding bill has been passed by the State Senate and awaits approval by the State House of Representatives. EPA Region 6 Nonpoint Source staff has been consulted and are supportive of the project. Their commitment to protecting and restoring water quality in the project area has been demonstrated by continued 319 funding in these watersheds. Meetings have been held with the State Department of Environmental Quality (ODEQ) and the Department of Wildlife Conservation (ODWC) and while they will have no formal role in this program, they strongly support it.

Large-scale 319 water quality projects are ongoing or recently concluded in both of the proposed watersheds. These programs are administered, staffed and planned by OCC who will also administer the proposed CREP program. Related to this proposal, the ODEQ is adjusting discharge permits to allow less phosphorus loading in these watersheds and the ODWC has been restoring stream habitat in the watersheds and has recently hired a full time stream fisheries biologist for these areas.

Monetary commitments from the State of Oklahoma will be listed in the final application at the end of the current legislative session. The State currently has $2,050,000 committed from the Oklahoma Scenic Rivers Commission and the City of Tulsa.

Technical assistance will be provided by employees of the Oklahoma Conservation Commission, the state Conservation District agency, and the technical lead agency for the state 319 program. Current employees are certified as plan writers (technical service providers) by the state office of NRCS and all new employees will be certified as well. OCC will coordinate all activity between itself, NRCS, and FSA.

Eligible Land

Landowners with pasture and/or cropland adjacent to streams, rivers, or lakes in the selected watersheds will be eligible for the program. The land in question must have been owned or operated by the applicant for the previous twelve months. Cropland must have been planted to a crop two of the previous five years and be physically and legally capable of being cropped. Marginal pastureland may also be enrolled provided it is suitable for use as a riparian buffer planted to trees, wildlife habitat buffer, or wetland buffer. Lands that have an existing CRP contract or an approved offer with a contract pending are not eligible for CREP until the contract expires.

Landowners interested in the program will receive a site visit from an OCC plan writer, who will update the existing conservation plan, or draft a new one to address the objectives of the program. If the landowner agrees to implement these recommended practices and provide the required match, their application will be ranked, along with other applications received during the sign-up period. Applications will be ranked based on cost per linear foot of restored riparian area (with lowest costs receiving higher ranks) and on increase in contiguous riparian area. These priorities will insure that more riparian area is restored and should encourage landowners to convince neighbors to participate.

Flow Chart of Application Process

The CREP application process would follow the steps proposed below:

STEP	IMPLEMENTERS	RESPONSIBILITIES
1	OCC, Conservation Districts, NRCS, FSA	**OCC will analyze current digital orthophotos of CREP watersheds to identify landowners with degraded riparian areas and these landowners will be contacted to encourage participation in the program. The program will also be advertised locally by Conservation Districts and NRCS.**

2		**Participants visit a USDA Service Center to review CREP program eligibility details and determine to proceed with CREP offer. Note: The initial contact with a CREP applicant may be done by scheduling an appointment with FSA, NRCS, Conservation District or OCC in the watershed or by walking in the front door.**
	Producer	• Visit USDA Service Center or Conservation District Office to receive information on CREP. • Complete "Record of Inquiry" when necessary • Discuss USDA eligibility requirements with USDA/OCC staff • Discuss State program options, payments, contracts, etc. with OCC/CD staff
	USDA Service Center	• Discuss CREP eligibility requirements with producers in the Illinois River and Eucha/Spavinaw Watershed areas
	Conservation District Offices and OCC	• Explain State program options, payment, contracts, optional voluntary permanent conservation easements, etc. with producers • Complete "Record of Inquiry" when necessary for interagency communications
3	OCC	**OCC plan writers will update current conservation plan or draft new plan to address the objectives of the CREP. Plan writers will also work with landowners to apply for additional USDA or similar programs to install complimentary BMPs in non-CREP eligible areas.**
4	OCC	**Applicants will be ranked based on the cost per linear foot of restored riparian area (Lowest costs getting higher ranks) and increases in contiguous riparian area (convincing neighbors to cooperate would increase ranking). Multiple sign-up periods are anticipated for the first two or three years of the program. Highest ranking applicants will be notified to pursue further action.**
5		**Producer initiates CRP-2C worksheet with FSA**
	Producer	• Initiate CRP-2C worksheet at County FSA office • File forms needed for producer eligibility determination • Specify practice and acreage offered
6		**FSA makes Participant and cropland eligibility determinations and forwards CRP-2C to applicable NRCS and Conservation District Office**
	County FSA Office	• Enter acreage offered on aerial photocopy • Discuss CREP provisions with producers in CREP area • Complete producer, land and practice eligibility determinations • Complete CRP-2C according to paragraph 138 if basic eligibility requirements are met • Send CRP-2C with attached aerial photocopy to NRCS • Send copy of CRP-2C to local Conservation District • Initiate CRP-1 (See Paragraph 140 of 2-CRP)
7		NRCS/OCC makes land eligibility determinations for designated CREP practices and completes Parts 14A-D and 17A-D of CRP-2C. FSA calculates the maximum payment rate for the offer.
	NRCS/OCC	Using Conservation Plan developed under Step 3: • Determine suitability of practice for acreage offered • Determine needs and feasibility of practice to solve the resource concerns • Complete CRP-2C, including soil map and soil acreage data. • Return completed CRP-2C to County FSA Office. Note: FSA calculates the Maximum Payment Rate
	Conservation District and OCC	• Assist NRCS with technical determinations and designs as necessary & directed by NRCS
8		**Participant visits Conservation District and FSA offices to complete and sign CRP-2C and CRP-1 and sign conservation plan. The participant will learn the consequence of a contract violation, including the possible refund of all payments and assessment of liquidated damages.**
	Producer	• Visits local CD & FSA office and signs state-local payment options

		contract, the Conservation Plan, Contract Support Document, and completes voluntary permanent easement application if applicable. • Signs completed CRP-2C and CRP-1.
	Conservation District (CD)/OCC	• CD/OCC determine that adequate acres and funds are available to meet contractual obligations. • CD Board approves and signs Conservation Plan. • Enters producer contract information into the CREP database and enters financial obligations into financial accounting system maintained by the CD. • Obtains producer signature on CPO and support documents • Supplies copies of state supplemental documents to FSA
	NRCS/OCC	• NRCS/OCC approves and signs Conservation Plan Contract Support Document • Sends copy of approved and signed Conservation Plan, and Contract Support Document to FSA Office.
	FSA	• Prepares CRP-2C & CRP-1 for producer signature • Provides copy of CRP-1 Appendix to producer • Informs producer annual rental payment period begins on the first day of the month following the month COC approves the CRP-1. (See paragraph 139 of 2-CRP) • Informs producer of length of contract period • Completes paid for measurement service, if required • Informs producer of additional requirements • Makes eligibility determinations – 1026, 502, 526, FCIC • Obtains all required producer signatures on CRP-2C and CRP-1 • Files all state supplemental documents in producers CRP folder
9		**County FSA Committee reviews documentation forwarded by CD, OCC, and NRCS before proceeding with Conservation Plan, Contract Support Document, and CRP-1 approval**
	County FSA Committee	• Reviews producer eligibility status, Conservation Plan, and Contract Support Document for approval and signatures
	County FSA Office	• Issues notice of CRP-1 approval to producer (Exhibit 50). • Issues CRP-SIP to producer, should such an incentive be available. • Issues AD-245 to producer • Sends AD-862 to NRCS for practices CP9, CP23, and CP23A only. • Sends AD-862 to SF for practices CP3, CP3A, CP31, and other practices where trees are the predominant cover. • CED shall complete Items 10 and 11 of AD-862 for any practice except CP9, CP23, CP23A, CP3, CP3A, and CP31. • Enters contract information in System 36
10		**Producer completes installation of conservation practice and provides necessary documentation.**
	Producer	• Completes practice according to Conservation Plan, practice specifications, and requirements. • Reports practice performance using page 2 of AD-245. • Certifies completion of practice on AD-862 for all SRW CREP practices except practices which needs determinations were completed by OCC, NRCS, FS, or other TSP. • Furnishes invoices, bills, and other supporting documents of practice costs to Conservation District Office
	CD/OCC	• Furnishes invoices, bills, and other supporting documents of practice costs to FSA County Office
11		**OCC certifies practice completion**
	OCC	• Completes and returns AD-862 to County FSA Office for practices CP9, CP23, and CP23A.
12		**County FSA Office calculates cost-share payment, PIP payment, and notifies CD of practice completion.**

	County FSA Office	• Calculates and issues cost-share payment to producer. • Calculates and issues PIP to producer, if applicable • Sends page 2 of AD-245 with transmittal memorandum to local CD.
13		**CD receives AD-245 and transmittal memorandum that certifies practice completion and FSA contract approval.**
	CD	• Reviews AD-245 and transmittal memorandum from County FSA Office. • Enters final contract information into CREP database. • Issues applicable local one-time incentive payment(s) to contract signatories. • Issues 1099 each tax year to those who receive payment.
14		**County FSA Office makes annual payments, compliance spot checks, and notifies CD of contract violations.**
	County FSA Office	• Issues annual rental payments when authorized. • Conducts spot checks according to 2-CRP for CRP-1 compliance after final status review. • Informs CD of contract violations, and other significant changes to CREP contracts.
	OCC/CD	• Assists County FSA with compliance spot checks
15	OCC	• By January 1st of each year, beginning in 2007, provides a report to the USDA FSA summarizing the status of enrollments under SRW CREP and progress on fulfilling the other commitments of this program.
		• By January 1st of each year, beginning in 2007, submits information summarizing the State's overall costs of the program.

Section 6 – Cost Analysis

The proposed Oklahoma CREP program is expected to cost between fifteen and fifty-four million dollars of federal, state, and local landowner monies, depending on the amount of non-federal match the State can allocate. This program has been developed using lessons learned from past implementation of riparian buffer programs in these areas of the State. Certain modifications have been made to standard BMPs to make them more amenable to local landowners while retaining their efficiency at improving water quality. In addition, certain types of land that would not regularly qualify for inclusion in a CRP program are considered eligible for this CREP program. Oklahoma believes inclusion of these lands is critical to the success of the program in these areas such that if federal dollars cannot be used to pay for the program on these lands, the State will fund the program in these areas. In addition to funding practices in areas federal funds may not be able to fund, the State will fund personnel to provide technical assistance and promotion of the program, monitoring to assess water quality improvements associated with the program, and reporting to summarize project results and progress.

Total Estimated Project Costs*

CREP Type	Watershed	Targeted Acres	Cost of Installation and Maintenance	CREP Dollars	Total State Match**	Estimated Total
Mini-CREP	Illinois River	2,343	$6,334,200.00	$5,766,700.00	$1,441,675.00	$7,208,3755.00
Mini-CREP	Lake Eucha	2,373	$6,415,300.00	$6,415,300.00	$1,603,825.00	$8,019,125.00
CREP Expansion***	Illinois River	12,828	$34,675,870.51	$28,153,976.41	$7,038,494.10	$35,170,870.51
CREP Expansion***	Lake Eucha	1,490	$4,027,531.80	$3,359,785.44	$839,946.36	$4,192,531.80
Full CREP	Illinois River	15,171	$41,010,070.51	$33,920,676.41	$8,480,169.10	$42,400,845.51
Full CREP	Lake Eucha	3,863	$11,460,331.80	$9,775,085.44	$2,443,771.36	$12,218,856.80
	Total	19,034	$52,470,402.31	$43,695,761.85	$10,923,940.46	$54,619,702.31

*Further detail on estimates for individual watersheds and breakdown of match sources/categories can be found in Appendix A.
** State match includes personnel and monitoring costs in addition to state match used for implementation.
**CREP Expansion will follow allocation from State legislature (approximately $10,000,000 for CREP in Illinois River, Eucha/Spavinaw, Fort Cobb, and Sugar Creek Watersheds)

Estimated State Costs of CREP Technical Assistance.

CREP Type	Watersheds	# Personnel	Length of employment	Total costs*
Mini-CREP	Eucha/Illinois River	1*	3 yrs FT, 12 yrs PT	$501,000
CREP Expansion	Eucha/Illinois River	4	3 yrs	$688,800
Full CREP	Eucha/Illinois River	5	5 FT for 3 yrs, then 1PT for 12 yrs,	$1,189,800

* Costs include salary, benefits, and vehicle lease.
**CREP Coordinator would be full-time for the first 3 years, then part time for the remainder of the program.

Estimated State Costs of CREP Monitoring.

Item	Units	Length of Time	Total Cost
Monitoring Personnel	0.5	15 yrs	$352,500
Autosamplers	5 @$6500 each		$32,500
Lab costs	5 sites @$100/site for 64 events	15 yrs	$480,000
WQ Monitoring Meters	2sets		$12,000
Vehicle lease	$4,000/yr	15 yrs	$60,000
Survey gear for stream morphology assessment			$20,000
1 meter resolution GPS unit			$2,500
Total			$959,500

Justification for Incentive Payments
Currently, all waterbodies covered by this proposal are 303d listed for phosphorus and/or bacteria. Successful 319 programs have conclusively shown that a program of this nature can reduce phosphorus loading in both a statistically and environmentally significant manner. Without this assistance, agriculture and the poultry industry will not be able to both protect the environment and keep the rural economy vibrant and growing.

Because these waters are currently listed as not attaining water quality standards, the state will have little choice other than to burden agriculture and related industry with additional regulations if water quality does not begin to improve. Given the current condition of the agricultural industries, they will not survive significant additional costs such as these.

Three Year Average Crop Acreage and Yield- Source – 2002 Ag Census

Crop	Adair		Cherokee		Delaware	
	acres	yield	acres	yield	acres	yield
Corn- grain	0	0	0	0	0	0
Cotton- upland	0	0	0	0	0	0
Hay- alfalfa	100	2	267	2	467	2.5
Hay- other	13,000	2.08	20,667	1.66	52,667	2.14
Peanuts	0	0	0	0	0	0
Sorghum- grain	0	0	0	0	433	57.7
Soybeans	0	0	0	0	1,267	22.4
Wheat- all	1,200	37.6	200	38.3	3,267	38.2

Section 7 – Monitoring Program

Both watersheds will be actively monitored. Auto-samplers with stage recorders will be installed near the outlet of each watershed. These samplers will be programmed to collect continuous flow-weighted samples from the stream of interest. Samples will be composited, acidified and stored at 4° C to await weekly shipment to the laboratory. Analysis will include nitrate/nitrite, total Kjeldahl nitrogen, and total phosphorus. Grab samples collected weekly from the same sites will include the above parameters plus alkalinity, conductivity, dissolved oxygen, pH, turbidity, instantaneous discharge, *Enterococcus* and *E. coli*. Other parameters may be added as information, science and public policy dictate. Monitors will also be installed where these streams enter Oklahoma from Arkansas so that pollutant loads added upstream of the project area can be accounted for and subtracted

from the total to arrive at the benefits seen from the proposed project. This type of monitoring has been shown to be extremely effective at detecting changes in water quality in a short time period and will allow us to detect effects of the program.

Between 7 and 15 stream reaches of 200 to 600 meters for each system will be selected and surveyed at the beginning and the end of the project and three times in between to measure changes to channel morphology that result from the project. Parameters that will be measured include bank full channel configuration including x-section and longitudinal profile, channel substrate particle size distribution, pool bottom substrate, instream cover available to fish, cobble embeddedness, and bank vegetative stability.

Fish and benthic macroinvertebrates will be collected from the above reaches at about the time of survey using a combination of electroshocking, seining and kick netting methods. Species and numbers collected will be tallied as well as the size classes of larger fish species.

All monitoring will be carried out by staff of the Water Quality Division of the Oklahoma Conservation Commission (OCC-WQ). Data will be compiled and analyzed by Commission staff as well. OCC-WQ staff will be responsible for preparing and submitting annual monitoring reports.

Because OCC has successfully carried out similar projects in all of the target areas, we anticipate that objectives will be met. Additionally, watershed modeling has predicted that implementation of this program will result in achievement of our water quality objectives. Should the data at any time indicate otherwise, additional modeling and monitoring will be performed to locate the pollutant contributing sub-watersheds and land use practices. If any are identified, they will be corrected using a combination of state, landowner and EPA Clean Water Act section 319 money.

Section 8 – Public Outreach and Support

As mentioned previously, OCC is operating programs very similar to the one proposed in both watersheds targeted. These programs have been extremely successful, both in terms of sign-up and in the environmental benefits gained. As time progresses, and word spreads among local producers, we find that new money is obligated as soon as it becomes available. Currently, there are large backlogs of landowners waiting for cost share assistance to become available.

The Oklahoma Conservation Commission (OCC) is the state agency in charge of implementing the State's 319 program and is the State Conservation District agency. As such, we feel confident that we can sell the CREP program. From 1998 to 2005, the OCC spent over $2.5 million in the Illinois River and Spavinaw Creek watersheds implementing BMPs such as riparian area protection, pasture management systems, livestock feeding areas, alternative water sources and other practices designed to retard the flow of nutrients to area streams. An additional $1.5 million is currently being targeted to the Eucha/Spavinaw watershed.

Through trial and error and through working with watershed resident agricultural producers, a set of practices have been arrived at that are agreeable to local producers and achieve significant water quality protection. All available monies were spent on these practices and on water quality monitoring in these watersheds and there is still a long waiting list of producers who wish to participate in these programs. Unfortunately, only a limited amount of 319 and state money is available and because of EPA rules, the incentive payments are only available for 4 to 5 years.

Riparian area and buffer protection and establishment are two of the most important practices needed to improve water quality. While many of these areas are currently protected through contracts written under the 319 program, these contracts will soon expire. Even more riparian areas are unprotected or currently in pasture with eroding stream banks because of lack of funds to meet the demand and because of lack of interest in short term contracts.

OCC currently has a full time outreach staff person in these watersheds devoted to education about the sources, effects and remedies of agricultural non-point source (NPS) pollution. These people currently devote over 50% of their time towards educating agricultural producers on these issues, and stress the value of riparian buffers as a crucial and absolutely necessary component of the overall farm plan. This education takes place at commodity group meetings, on tours of demonstration sites, at booths set up at Ag shows, in Conservation District offices and on site visits of individual farms.

In addition to the specialized educator, OCC has three additional education staff that service the entire state and focus on agricultural NPS pollution issues. Beyond this, the technicians hired in the watersheds are expected to sell the program by meeting with local producers in groups and one on one. During these meetings they will educate producers on the ecological benefits of the CREP program and also on the benefits of the CREP program to the profitability of the farming operation.

The practices and cost-share rates offered through previous 319 projects were recommended by a local watershed advisory group (WAG). These WAGs were composed of stakeholders in the watershed (cattlemen, dairymen, poultry growers, wheat farmers, resident homeowners, mayor of Tulsa, etc), and chaired by Conservation District Board Members. The WAG members, recommended by Conservation Districts, were chosen because they were influential, respected members of the community who could represent community issues to the program, and water quality issues to the community. As such, the WAG members also served to promote the programs at the local level. In addition to a standard WAG, we also assembled Education Watershed Advisory Groups (EdWAGs) to design the education programs that should accompany the cost-share programs. The EdWAG was also made up of influential watershed citizens, along with area educators ranging from high school vo-ag teachers to Cooperative Extension Water Quality Specialists. These EdWAGs will be reformed to address education and communication issues related to the CREP program. They will recommend programs and activities that will be pursued by OCC education and outreach staff in these watersheds throughout the program life.

The State Cooperative Extension Service has also been a long-time promoter of the benefits of riparian buffer systems. They have developed a Riparian Area Management Handbook, a stream model trailer to demonstrate the benefits of riparian area management in education programs, and many other educational materials and programs geared at riparian area protection. They will continue to promote these practices and support education programs in these watersheds. It's expected that the above educational efforts will continue throughout the life of the project.

Section 9 – Development of Procedures

TO BE DEVELOPED BY OK FSA IN CONJUNCTION WITH FSA HEADQUARTERS AFTER ACCEPTANCE OF PROPROSAL

Section10 – Training of Staff

FSA and NRCS will train federal staff as appropriate for this project. Specific technicians will be hired by OCC to promote the program and add the CREP practices onto existing farm plans or to create new farm plans if necessary. FSA will train these technicians on all CREP procedures and the State NRCS office will provide training and certification on plan writing. Currently, OCC has one technician certified by NRCS to write comprehensive nutrient management plans and three certified for general farm plans. All of these people plus the CREP program technicians will be trained and certified by the state NRCS office to write and implement plans for the CREP program.

Section 11 – Communication Plan

An Outreach and Education Communication Plan Workgroup will be formed in each targeted watershed. These groups will be identical to the EdWAG Groups that OCC has been utilizing to implement our 319 programs. Each workgroup will consist of at least one District Board member from the District(s) in which the watershed lies. With advice from Conservation District staff, farmer/ranchers seen as community leaders representing all important facets of local agriculture will also be selected as well as a local vo-ag teacher, and someone from the local ag banking community. Additional members may represent local recreational interests and officials of towns who use the water for a drinking water supply. Master Conservancy Districts and other units of local government that deal with water quality Such as the Scenic Rivers Commission will have representation where appropriate.

This workgroup will develop the communication and education plans under the guidance of OCC with concurrence of the state FSA office.

The communication plan will be developed with the goal of providing local communities with the communications, education, and marketing support to ensure success of the CREP program throughout the selected areas. The following objectives will be important in meeting that goal:

- Obtain 100% awareness of the CREP program among landowners with degraded or threatened riparian areas in the selected watersheds,
- Provide 100% of the aforementioned landowners with information about economic and environmental benefits of riparian buffer protection,
- Create a positive response to CREP program in the community affected by the CREP (including not only ag producers eligible for the program, but water users of downstream reservoirs, and state tax payers in general),
- Develop or otherwise provide resources and materials to help OCC CREP technicians promote and enlist cooperators in the CREP program,
- Build and maintain a coalition of Federal, State, and most importantly, local stakeholders to promote the program,
- Identify methods to maximize riparian protection beyond the life of, boundaries assigned to, and resources available through the proposed CREP program,
- Additional objectives determined by the local EdWAG, once it has been reassembled.

The communication plan will recognize the following motivators to enrollment, and possibly identify additional motivators, based on personal knowledge of the watershed and community:

- To conserve natural resources including soil, forests, and wildlife,
- To improve the land and its value,
- To improve water quality,
- To improve farm productivity, either through improved profits, or decreased work maintaining marginal lands,
- To reduce the likelihood of additional lawsuits and/or future regulations,
- Increased incentives for installation and maintenance of conservation practices.

The communications plan will recognize the following barriers to enrollment (and possibly additional ones based on more intimate knowledge of the local community and its needs) and seek ways to minimize the effect of these barriers:

- Investment of time and money,
- Ever increasing costs of implementation and maintenance,
- Hesitation to commit to a long-term program that may restrict ability to use or sell your land,
- Increasing pressure to develop urban land in northeastern Oklahoma, and
- Government guidelines.

The communications plan will describe the development and/or use of the following tools and materials:

- Door-to-door presentations and phone calls
- Brochures,
- Fact Sheets,
- Riparian Management Handbook,
- Press releases, newspaper articles, radio spots,
- Signs,
- Events, activities, tours, presentations and displays at public meetings,
- Mail outs,
- Additional tools as determined by the EdWAG.

APPENDIX A:

Calculations of Funds Necessary for Proposed CREP Watersheds

Estimated Costs of CREP in Illinois River Watershed

Riparian Area in the Illinois River Watershed			108,276
Estimated Percent Degradation			50%
Estimated Restoration Area (Degraded buffer)			53,932
	Estimated Degraded buffer Area that is CRP eligible (acres)		35,383
	Non-CRP eligible degraded buffer area (includes some forest)		18,550
Establishment Costs per acre			
			Dollars
	Cost-share to install practices (50% of $1,200)- tree planting, fencing, site prep.		$600.00
	PIP (practice incentive payment) (40% of 1,200)		$480.00
	Total Cost to Establish per acre		$1,080.00
	Anticipated Coverage (assume 28% participation)		15,172 acres
Total Cost to Establish			$16,385,822
Cost to Maintain Fifteen Year Contract – cost per acre per year			
	Rental Payment		$73.50
	Riparian Buffer Installation (20% of *)		$14.70
	Subtotal		$88.20
	SIP (signing incentive payment)		$10.00
	Maintenance payment ($7, $9, or $10)		$10.00
	Total cost per acre		$108.20
Cost to maintain 15 year contract per acre			$1,623.00
Anticipated Coverage (assume 28% participation)			15,212 acres
Total Maintenance for 15 years			$24,624,249
Federal (CREP) Total for Establishment and 15 years maintenance			**$33,920,676**
CREP Required **State Match (20%)**			**$8,480,169**
Technical Support Personnel		$767,100	
State Match for Implementation		$7,089,394	
Monitoring Costs		$623,675	
Total Implementation Costs for Illinois River with 20% state match requirement			**$41,010,071**
Program Total			**$42,400,845.51**

*

Estimated Costs of CREP in Spavinaw Watershed

Estimated Restoration Area (Degraded buffer)			5,913
	Estimated Degraded buffer Area that is CRP eligible (acres)		4,730
	Non-CRP eligible degraded buffer area (includes some forest)		1,183
Establishment Costs per acre			
			Dollars
	Cost-share to install practices (50% of $1,200)- tree planting, fencing, site prep.		$600.00
	PIP (practice incentive payment) (40% of $1,200)		$480.00
	Total Cost to Establish per acre		$1,080.00
	Anticipated Coverage (assume 65% participation)		3,863
Total Cost to Establish			$4,172,497
Cost to Maintain Fifteen Year Contract – cost per acre per year			
	Rental Payment*		$73.50
	Riparian Buffer Installation (20% of *)		$14.70
	Subtotal		$88.20
	SIP (signing incentive payment)		$10.00
	Maintenance payment ($7, $9, or $10)		$10.00
	Total cost per acre		$108.20
Cost to maintain 15 year contract per acre			$1,623
Anticipated Coverage (assume 30% participation)			3,863 acres
Total Maintenance for 15 years			$6,270,335
Federal (CREP) Total for Establishment and 15 years maintenance			**$9,775,085**
CREP Required State Match (20%)			**$2,443,771**
Technical Support Personnel		$404,700	
State Match for Implementation		$435,246	
City of Tulsa purchase of permanent easements		$1,250,000	
Monitoring Costs		$335,825	
Total Implementation Costs for Spavinaw Watershed with 20% state match requirement			**$11,460,332**
Total Program Costs			**$12,218,856.80**

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APPENDIX B
RELEVANT LAWS AND REGULATIONS

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APPENDIX B—RELEVANT LAWS AND REGULATIONS

This following is a non-exclusive and brief discussion of the relevant laws and regulations that form the basis of the programmatic environmental analysis for the proposed Conservation Reserve Enhancement Program agreement for Oklahoma.

Clean Air Act

The *Clean Air Act* (42 *United States Code* [USC] 85 parts 7401 et seq., 1999) regulates air emissions from area, stationary, and mobile sources, and authorizes the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. Sections 107 and 110 of the *Clean Air Act* give each State responsibility for ensuring that pollution levels within their borders are consistent with NAAQS.

Clean Water Act

The *Clean Water Act* (CWA) (33 USC 26 parts 1251 et seq., 2000), formally known as the *Federal Water Pollution Control Act*, was passed to restore and protect the waters of the U.S. CWA established the basic structure for regulating discharges of pollutants into the waters of the U.S. It continued requirements to set water quality standards for all contaminants in surface waters and gave EPA the authority to implement pollution control programs. In addition, CWA recognized the need for planning to address the critical problems posed by non-point source pollution, such as that generated by agricultural production (e.g., runoff and leaching of pesticides and fertilizers).

Endangered Species Act

The *Endangered Species Act* (ESA) (16 USC 35 parts 1531 et seq., 1988) was enacted to conserve threatened and endangered species and the critical habitats in which they exist. When a species is designated as threatened with extinction, a recovery plan that includes restrictions on cropping practices, water use, and pesticide use is developed to protect the species from further population declines. All Federal agencies are required to implement ESA by ensuring that their actions do not jeopardize the continued existence of any listed species. Section 7 of ESA requires that project areas must be checked against U.S. Fish and Wildlife Service and State listings of threatened and endangered species and critical habitat.

ESA defines an endangered species as one that is in danger of extinction throughout all or a significant portion of its range. Threatened means a species is likely to become endangered within the foreseeable future. These designations may be applied to all species of plants and animals, except pest insects. A species may be threatened at the State level, but that same designation does not necessarily apply across the U.S., as species numbers may be greater in other States. Critical habitat is defined by ESA as areas that are essential to the conservation of listed species.

Executive Order 11514, Protection and Enhancement of Environmental Quality

Executive Order (EO) 11514, *Protection and Enhancement of Environmental Quality* (35 *Federal Register* [FR] 4247, 1977), mandated the Federal government to provide leadership in protecting and enhancing the quality of the environment to sustain and enrich human life. Federal agencies are required to initiate measures needed to direct their policies, plans, and programs so as to meet national environmental goals.

Executive Order 11988, Floodplain Management

EO 11988, *Floodplain Management* (42 FR 26951, 1979), compels Federal agencies to restore and preserve the natural and beneficial values served by floodplains by: 1) avoiding short-term and long-term adverse impacts associated with the occupancy and modification of floodplains; and 2) avoiding direct

and indirect support of floodplain development wherever there is a practicable alternative. Federal agencies are required to take actions that will reduce the risk of flood loss and minimize the impact of floods on human safety, health and welfare.

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 FR 32, 1995), requires Federal agencies to make achieving environmental justice part of their mission by considering whether their programs, policies, and activities may have adverse impacts to minority or low-income populations. This EO emphasizes the importance of the public participation process, directing each Federal agency to provide opportunities for community input in the *National Environmental Policy Act* (NEPA) process by providing access to public documents and providing notices and hearings.

Food Security Act of 1985

The Conservation Reserve Program (CRP) was established under Title XII of the *Food Security Act of 1985* (16 USC 58 part 3831, 1996). The purpose of CRP is to cost-effectively assist owners and operators in conserving and improving soil, water, and wildlife resources on their farms and ranches. Highly erodible and other environmentally sensitive acreage, normally devoted to the production of agricultural commodities, is converted to a long-term resource conservation cover. Conservation compliance provisions for highly erodible land are commonly referred to as *Sodbuster* provisions. Wetland conservation provisions, commonly known as *Swampbuster* provisions, help preserve the environmental functions and values of wetlands, including flood control, sediment control, groundwater recharge, water quality, wildlife habitat, recreation, and aesthetics.

The *Farm Security and Rural Investment Act of 2002*, commonly known as the *2002 Farm Bill*, authorizes CRP through 2007 and raises the overall enrollment cap to 39.2 million acres (16 USC 58 part 3831, 1996). CREP is authorized pursuant to the *Federal Agriculture Improvement and Reform Act of 1996* and is a subset of CRP (7 USC 100 parts 7201 et seq., 1998).

National Environmental Policy Act of 1969

NEPA is intended to help Federal officials make decisions that are based on consideration of the environmental consequences of their actions, and to take actions that protect, restore, and enhance the environment. NEPA mandates that Federal agencies consider and document the impacts that major projects and programs may have on the environment. The Council on Environmental Quality provides implementing regulations (40 *Code of Federal Regulations* [CFR] 30 parts 1500 et seq., 2005). NEPA guidance for the Farm Service Agency is obtained through *Environmental Quality and Related Environmental Concern—Compliance with the National Environmental Policy Act* (7 CFR 7 parts 799 et seq., 2006).

National Historic Preservation Act

The *National Historic Preservation Act* (NHPA) (16 USC 1A part 470, 2000) establishes as Federal policy the protection of historic properties and their values. Subsequent amendments designate the State Historic Preservation Office (SHPO) or the Tribal Historic Preservation Office (THPO) as the party responsible for administering programs in the States or reservations. Federal agencies are required to consider the effects of their undertakings on historic resources, and to give SHPO/THPO a reasonable opportunity to comment on those undertakings. NHPA implementing regulations (36 CFR 8 parts 800.3–800.13, 2005) govern compliance with Section 106 of NHPA, which must be followed in planning any Federal agency activity and in the ongoing management of agency resources.

REFERENCES

7 CFR 7 parts 799 et seq. 2006. "Environmental Quality and Related Environmental Concerns—Compliance with the National Environmental Policy Act." Farm Service Agency, Department of Agriculture. *Code of Federal Regulations*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/cfr/index.html. January 1. Accessed February 23, 2006.

36 CFR 8 parts 800.3–800.13. 2005. "Subpart B—The Section 106 Process." Protection of Historic Properties. Parks, Forests, and Public Property. Advisory Council on Historic Preservation. *Code of Federal Regulations*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/cfr/index.html. July 1. Accessed February 23, 2006.

40 CFR 30 parts 1500 et seq. 2005. "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act." Chapter 5. Council on Environmental Quality, Executive Office of the President. *Code of Federal Regulations*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/cfr/index.html. July 1. Accessed February 23, 2006.

35 FR 4247. 1977. Executive Order 11514, as amended. "Protection and Enhancement of Environmental Quality." *Federal Register*. U.S. National Archives and Records Administration. Available via http://www.archives.gov/federal-register/codification/executive-order/11514.html. Accessed February 23, 2006.

42 FR 26951. 1979. Executive Order 11988, as amended. "Floodplain Management." *Federal Register*. U.S. National Archives and Records Administration. Available via http://www.archives.gov/federal-register/codification/executive-order/11988.html. Accessed February 23, 2006.

59 FR 32. 1995. Executive Order 12898, as amended. "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." *Federal Register*. U.S. National Archives and Records Administration. Available via http://www.archives.gov/federal-register/executive-orders/1994.html. Accessed February 23, 2006.

7 USC 100 parts 7201 et seq. 1998. "Federal Agriculture Improvement and Reform Act of 1996," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 1A part 470. 2000. "National Historic Preservation Act of 1966," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 35 parts 1531 et seq. 1988. "Endangered Species Act of 1973," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

16 USC 58 part 3831. 1996. "Conservation Reserve," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

33 USC 26 parts 1251 et seq. 2000. "Federal Water Pollution Control Act of 1972," commonly referred to as the *Clean Water Act*, as amended. *United States Code*. U.S. Government Printing Office via

GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

42 USC 85 parts 7401 et seq. 1999. "Clean Air Act," as amended. *United States Code*. U.S. Government Printing Office via GPO Access. Available via http://www.gpoaccess.gov/uscode/index.html. Accessed February 23, 2006.

APPENDIX C
SUMMARY OF CONSERVATION PRACTICES

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APPENDIX C—SUMMARY OF CONSERVATION PRACTICES

Following this paragraph is a summary listing of Farm Service Agency (FSA) conservation practices (CPs) for the proposed Oklahoma Conservation Reserve Enhancement Program (CREP).

CP21—Filter Strips *

Purposes:

- Reduce pollution and protect surface water and subsurface water quality
- Reduce sediment, particulate organics, and sediment-adsorbed contaminant loadings in runoff
- Reduce dissolved contaminant loadings in runoff
- Reduce sediment, particulate organics, and sediment-adsorbed contaminant loadings in surface irrigation tailwater
- Restore, create, or enhance herbaceous habitat for wildlife and beneficial insects
- Maintain or enhance watershed functions and values.

Maintenance Standards:

- Encourage shallow sheet water flow across the filter so that the filter functions properly
- Repair channels or rills immediately
- Treat concentrated flow areas using terraces, dikes, berms, trenches, or vegetative barriers
- Remove sediment when accumulation reaches a height of 6 inches or higher and level filter so that sheet flow is re-established
- Filter strips removing bacteria or other pathogens may be closely mowed to allow sunlight and air movement to decimate entrapped pathogens
- Control all weeds, particularly noxious weeds, in the filter area
- Use pre-approved prescribed burning to manage and maintain filter strip.

CP22—Riparian Buffer *

Purposes:

- Remove nutrients, sediment, organic matter, pesticides, and other pollutants from surface runoff and subsurface flow using vegetation
- Reduce pollution and protect surface water and subsurface water quality while enhancing the ecosystem of the water body
- Provide a source of detritus and woody debris for aquatic wildlife while enhancing habitat for terrestrial wildlife

- Create shade to lower water temperatures to improve habitat for aquatic organisms
- Create wildlife habitat and establish wildlife corridors
- Reduce excess amounts of sediment, organic material, nutrients, and pesticides in surface runoff and reduce excess nutrients and other chemicals in shallow groundwater flow
- Provide a harvestable crop of timber, fiber, forage, fruit, or other crops consistent with other intended purposes
- Restore natural riparian plant communities
- Moderate winter temperatures to reduce freezing of aquatic over-wintering habitats
- Increase carbon storage in plant biomass and soils
- Increase connectivity of existing terrestrial wildlife habitats.

Maintenance Standards:

- Prevent grazing of buffers by domestic livestock
- Establish vegetation that closely matches native and historical vegetation
- Periodically harvest trees, once buffer stands mature, to maintain plant health and buffer function
- Control noxious weeds and other undesirable plants, insects, and pests
- Apply registered chemicals, strictly according to authorized and registered uses, to control unwanted vegetation and pests.

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*These National CPs have been modified specifically for the Oklahoma CREP agreement. Relevant modifications of CP21 and CP22 are as follows:

- Grasses planted in zone three may be fescue and Bermuda in addition to native grasses.
- The combined width of zones one, two, and three will not exceed 100 feet or more than 30 percent of the geomorphic floodplain, whichever is greater.
- Haying will be allowed from July 1 to August 15 if forage is kept above the minimum annual average residual heights specified by the Natural Resource Conservation Service (NRCS), which are 4 inches for cool season grasses and 10 inches for warm season grasses (FSA 2003).
- Small areas of grazed forest within large pastures of mixed systems will be eligible for enrollment (up to and including areas that are 40 percent forested). Required fencing in these areas will be cost-shared.
- Livestock must be kept out of zones one and two with temporary or permanent fencing.
- Winter feeding areas (i.e., covered heavy use areas that have dry manure storage) will be constructed outside of the geomorphic floodplain (NRCS 2002).
- Stream crossings may be installed to allow livestock and equipment movement across streams.
- Alternative water sources may be developed within 1,500 feet of the edge of zone three. County approval will be required for development of alternative water sources.
- Upon county approval, watering facilities will allow up to 1,500 feet of pipeline use.

REFERENCES

FSA. 2003. *Agricultural Resource Conservation Program for State and County Offices*. Farm Service Agency, U.S. Department of Agriculture. Washington, DC. May 3. 152 pp and 48 exhibits.

NRCS. 2002. *Heavy Use Area Protection: NRCS Practice Code 561*; and *Waste Storage Facilities: NRCS Practice Code 313*. Natural Resource Conservation Service, U.S. Department of Agriculture. Available via http://www.ok.nrcs.usda.gov/technical/omplans.html. Accessed January 25, 2006.

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APPENDIX D
FISH SPECIES IN OKLAHOMA

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APPENDIX D—FISH SPECIES IN OKLAHOMA

Table D–1 lists fish species in Oklahoma. The Oklahoma Department of Wildlife Conservation (ODWC) safeguards and makes regulations for the management of approximately 176 fish species that occur throughout the State.

Table D–1. Fish species in Oklahoma.

Common Name	Scientific Name	Common Name	Scientific Name
Alabama shad	*Alosa alabamae*	Mooneye	*Hiodon tergisus*
Alligator gar	*Atractosteus spatula*	Mosquito fish	*Gambusia affinis*
American eel	*Anguilla rostrata*	Mottled sculpin	*Cottus carolinae*
Arkansas darter	*Etheostoma cragini*	Mountain madtom	*Noturus eleutherus*
Arkansas River shiner	*Noropis girardi*	Mud darter	*Etheostoma asprigene*
Arkansas River speckled chub	*Macrhybopsis tetranema*	Neosho madtom	*Noturus placidus*
Banded darter	*Etheostoma zonale*	Northern studfish	*Fundulus catenatus*
Banded pygmy sunfish	*Elassoma zonatum*	Orangebelly darter	*Etheostoma radiosum*
Bantam sunfish	*Lepomis symmetricus*	Orange-spotted sunfish	*Lepomis humilis*
Bigeye chub	*Hybopsis amblops*	Orangethroat darter	*Etheostoma spectabile*
Bigeye shiner	*Notropis boops*	Ouchita Mountain shiner	*Lythurus snelsoni*
Bigmouth buffalo	*Ictiobus cyprinellus*	Ozark cavefish	*Amblyopsis rosae*
Bigscale logperch	*Percina macrolepida*	Ozark minnow	*Notropis nubilus*
Black buffalo	*Ictiobus niger*	Paddlefish	*Polyodon spathula*
Black bullhead	*Ameiurus melas*	Pallid shiner (chub)	*Hybopsis amnis*
Black crappie	*Pomoxis nigromaculatus*	Peppered (colorless) shiner	*Notropis perpallidus*
Black redhorse	*Moxostoma duquesnei*	Pirate perch	*Aphredoderus sayanus*
Blackside darter	*Percina maculata*	Plains killifish	*Fundulus zebrinus*
Blackspot shiner	*Notropis atrocaudalis*	Prairie speckled chub	*Macrhybopsis australis*
Blackspotted topminnow	*Fundulus olivaceus*	Pugnose shiner (minnow)	*Notropis emilae*
Blackstripe topminnow	*Fundulus notatus*	Quillback	*Carpiodes cyprinus*
Blacktail shiner	*Cyprinella venusta*	Rainbow trout	*Oncorhynchus mykiss*
Blue catfish	*Ictalurus furcatus*	Red River pupfish	*Cyrinodon rubrofluviatilis*
Blue River least darter	*Etheostoma sp.*	Red River shiner	*Notropis bairdi*
Blue sucker	*Cycleptus elongates*	Redbreasted sunfish	*Lepomis auritus*

Common Name	Scientific Name	Common Name	Scientific Name
Bluegill sunfish	*Lepomis macrochirus*	Redear sunfish	*Lepomis microlophis*
Bluehead shiner	*Pteronotropis hubbsi*	Redfin darter	*Etheostoma whipplei*
Bluntface shiner	*Cyprinella camurus*	Redfin pickerel	*Esox americanus*
Bluntnose darter	*Etheostoma chlorosomum*	Redfin shiner	*Lythurus umbratilis*
Bluntnose minnow	*Pimaphales notatus*	Redspot chub	*Nocomis asper*
Bowfin	*Amia calva*	Ribbon shiner	*Lythurus fumeus*
Brindled madtom	*Noturus miurus*	River carpsucker	*Carpiodes carpio*
Brook silverside	*Labidesthes sicculus*	River darter	*Percina shumardi*
Brown bullhead	*Ameiurus nebulosus*	River redhorse	*Moxostoma carinatum*
Brown trout	*Salmo trutta*	River shiner	*Notropis blennius*
Bullhead minnow	*Pimaphales vigilax*	Rock bass	*Ambloplites rupestris*
Cardinal shiner	*Luxilus cardinalis*	Rocky shiner	*Notropis suttkusi*
Central stoneroller	*Campostoma anomalum*	Rosyface shiner	*Notropis rubellus*
Chain pickerel	*Esox niger*	Sand shiner	*Notropis stramineus*
Channel catfish	*Ictalurus punctatus*	Sauger	*Sander canadensis*
Channel darter	*Percina copelandi*	Saugeye	*Sander canadense x vitreus*
Chestnut lamrey	*Ichthyomyzon castaneus*	Scaly sand darter	*Ammocrypta vivax*
Chub shiner	*Notropis potteri*	Shoal speckled chub	*Macrhybopsis hystoma*
Creek chub	*Semotilus atromaculatus*	Shorthead redhorse	*Moxostoma macrolepidotum*
Creek chubsucker	*Erimyzon oblongus*	Shortnose gar	*Lepisosteus platostomus*
Creole darter	*Etheostoma collettei*	Shovelnose sturgeon	*Scaphirhynchus platorynchus*
Crystal darter	*Crystallaria asprella*	Silverband shiner	*Notropis shumardi*
Cypress darter	*Etheostoma proeliare*	Silvery chub	*Macrhybopsis storeriana*
Cypress minnow	*Hybognathus hayi*	Silvery minnow	*Hybognathus nuchalis*
Dollar sunfish	*Lepomis marginatus*	Skipjack	*Alosa chrysochloris*
Dusky darter	*Percina sciera*	Slender madtom	*Noturus exilis*
Emerald shiner	*Notropis atherinoides*	Slenderhead darter	*Percina phoxocephala*
Fantail darter	*Etheostoma flabellare*	Slim minnow	*Pimephales tenellus*
Fathead minnow	*Pimephales promelas*	Slough darter	*Etheostoma gracile*

Common Name	Scientific Name	Common Name	Scientific Name
Flathead catfish	*Pylodictis olivaris*	Smallmouth bass	*Micropterus dolomieui*
Flathead chub	*Platygobio gracilis*	Smallmouth buffalo	*Ictiobus bubalus*
Flier	*Centrarchus macropterus*	Southern brook lamprey	*Ichthyomyzon gagei*
Freckled madtom	*Noturus nocturnes*	Southern red-bellied dace	*Phoxinus erythrogaster*
Freshwater drum	*Aplodinotus grunniens*	Speckled darter	*Etheostoma stigmaeum*
Ghost shiner	*Notropis buchanani*	Spotfin shiner	*Cyprinella spilopterus*
Gizzard shad	*Dorosoma cepedianum*	Spotted bass	*Micropterus punctulatus*
Golden redhorse	*Moxostoma erythrurum*	Spotted gar	*Lepisosteus oculatus*
Golden shiner	*Notemigonus crysoleucas*	Spotted sucker	*Minytrema melanops*
Golden topminnow	*Fundulus chrysotus*	Spotted sunfish	*Lepomis punctatus*
Goldeneye	*Hiodon alosoides*	Starhead minnow	*Fundulus blairae*
Goldenstripe darter	*Etheostoma parvipinne*	Steelcolor shiner	*Cyrinella whipplei*
Gravel chub	*Erimystax x-punctata*	Stonecat	*Noturus flavus*
Green sunfish	*Lepomis cynellus*	Striped bass	*Morone saxatilis*
Greenside darter	*Etheostoma blennioides*	Striped mullet	*Mugil cephalus*
Harlequin darter	*Etheostoma histrio*	Striped shiner	*Luxilus chrysocephalus*
Highfin carpsucker	*Carpiodes velifer*	Suckermouth minnow	*Phenacobius mirabilis*
Hogsucker	*Hypentelium nigricans*	Sunburst (stippled) darter	*Etheostoma punctulatum*
Hybrid striped bass	*Morone saxtilis x chrysops*	Swamp darter	*Etheostoma fusiforme*
Inland silverside	*Menidia beryllina*	Tadpole madtom	*Noturus gyrinus*
Ironcolor shiner	*Notropis chalybaeus*	Taillight shiner	*Notropis maculates*
Johnny darter	*Etheostoma nigrum*	Threadfin shad	*Dorosoma petenense*
Kiamichi shiner	*Notropis ortenburgeri*	Walleye	*Sander vitreus*
Lake chubsucker	*Erimyzon sucetta*	Warmouth	*Lepomis gulosus*
Largemouth bass	*Micropterus salmoides*	Wedgespot shiner	*Notropis greenei*
Least darter	*Etheostoma microperca*	Western sand darter	*Ammocrypta clara*
Leopard darter	*Percina pantherina*	White (sand) bass	*Morone chrysops*
Logperch	*Percina caprodes*	White crappie	*Pomoxis annularis*
Longear sunfish	*Lepomis megalotis*	White sucker	*Catostomus commersoni*
Longnose darter	*Percina nasuta*	Yellow bass	*Morone mississippiensis*

Common Name	Scientific Name	Common Name	Scientific Name
Longnose gar	*Lepisosteus osseus*	Yellow bullhead	*Ameiurus natalis*
Mimic shiner	*Notropis volucellus*		
Source: ODWC 2005			

REFERENCES

ODWC. 2005. Oklahoma's Comprehensive Wildlife Conservation Strategy. Oklahoma Department of Wildlife Conservation. Available via http://www.wildlifedepartment.com/CWCS.htm. Accessed January 9, 2006.

APPENDIX E
SURFACE WATERS

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APPENDIX E—SURFACE WATERS

Table E–1 lists surface waters within the region of influence (ROI) of the proposed Oklahoma Conservation Resource Enhancement Program, which includes lands in the Tenkiller and Spavinaw watersheds.

Table E–1. Surface waters within the ROI.

Watershed	Waterbody		
Tenkiller	Ballard Creek	Flint Creek	Smith Hollow Creek
	Baron (Barren) Fork	Green Creek	Spade Creek
	Burnt Cabin Creek	Illinois River	Tahlequah Creek
	Caney Creek	Luna Branch	Tailholt Creek
	Carters Creek	Park Hill Branch	Stillwater City Lake
	Cato Creek	Peacheater Creek	Tate Parris Branch
	Chicken Creek	Peavine Creek	Tenkiller Ferry Lake
	Crazy Creek (Glasby)	Pettit Creek	Terrapin Creek
	Deep Branch	Pine Creek	Tyner Creek
	Dry Creek	Rock Branch	Walltrip Branch
	Elk Creek	Salt Branch	Welling Creek
	Evansville Creek	Sager Creek	West Branch
	Fall Branch	Shell Branch	Winset Hollow Creek
	Fagan Creek	Sismore Creek	
Spavinaw	Beaty Creek	Cloud Creek	Rattlesnake Creek
	Black Hollow Creek	Dry Creek	Spavinaw Creek
	Brush Creek	Hog Eye Creek	Spavinaw Lake
	Cherokee Creek	Lake Eucha	

Source: U.S. Geological Survey (USGS) 2003

REFERENCE

USGS. 2003. *State of Oklahoma: Streams*; and *State of Oklahoma: Lakes*. Geographic Information System shapefiles. U.S. Geological Survey. Available via the Oklahoma Center for GeoSpatial Information website at http://www.ocgi.okstate.edu/zipped/. Accessed February 8, 2006.

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APPENDIX F
NET PRESENT VALUE ANALYSIS

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APPENDIX F—NET PRESENT VALUE ANALYSIS

Data used for the net present value analysis for the proposed Oklahoma Conservation Resource Enhancement Program over 15 years is shown on the following page of this appendix.

Year	Discount Factor	Cost Share Implementation (FSA)	State Implementation Match	Producer Implementation Costs	Practice Incentive Payments	Tulsa Permanent Easements	State Technical Assistance	State Monitoring	Signing Incentive Payments	Rental Rate	Riparian Buffer Maintenance	Maintenance	Lost Jobs	Lost Sales	Sum	NPV
2007	1.00	11,421,000	7,524,640	-3,896,360	9,136,800	1,250,000	287,000	126,500	2,855,250	1,399,073	506,959	435,651	-476,348	-2,613,359	27,956,805	27,956,805
2008	0.95						287,000	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-401,525	-381,449
2009	0.90						287,000	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-401,525	-362,376
2010	0.86						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-566,832
2011	0.81						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-538,491
2012	0.77						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-511,566
2013	0.74						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-485,988
2014	0.70						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-461,688
2015	0.66						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-438,604
2016	0.63						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-416,674
2017	0.60						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-395,840
2018	0.57						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-376,048
2019	0.54						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-357,246
2020	0.51						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-339,383
2021	0.49						27,400	59,500		1,399,073	506,959	435,651	-476,348	-2,613,359	-661,125	-322,414
TOTAL		11,421,000				1,250,000	1,189,800	959,500	2,855,250	20,986,088	7,604,384	6,534,758	-7,145,220	**-39,200,385**	**19,220,254**	**22,002,206**
NPV Per Acre																**1,156**

Assumptions:

1) 5% discount rate
2) State match based on highest estimated cost from draft CREP agreement
3) State technical assistance based on 3 persons @ $36,000 each
4) Average rental rate of $73.50